Modern Plastics
Nov. 1935

# MODERN PLASTICS

E. F. LOUGEE, EDITOR
D. E. A. CHARLTON, EDITORIAL DIRECTOR

NOVEMBER, 1935 VOLUME 13 NUMBER 3

## • OF GENERAL INTEREST



## • TECHNICALLY INCLINED



## • NEWS AND FEATURES



LAWRENCE E. STOUT

## NEXT MONTH

Lawrence E. Stout, associate professor of chemical engineering, Washington University, will predict the future of plastics in industry as seen by a chemical engineer. An article written by Mr. Stout, collaborating with R. J. Collins, about the use of plastics in applying wood veneer (Modern Plastics, June 1935) brought forth considerable reader comment.

An interview with Belle Kogan, presenting the feminine viewpoint in design, written by Marcy Babbitt, should interest manufacturers whose products are created to be sold to women.

Published the 5th of each month by Breskin & Charlton Publishing Corporation. Advertising, editorial and general offices at 425 Fourth Ave., New York, N. Y. Telephone Ashland 4-0655. Western office, 221 N. La Salle St., Room 620, Chicago, Illinois. Telephone Randolph 6336. New England office, 143 Newbury St., Boston, Mass. Telephone Commonwealth 2722. Publication office, Erie Ave., F to G Sts., Philadelphia, Pa.

BRIANT SANDO, Publishing Director PERRY H. BACKSTROM, Advertising Manager M. A. CLINE, Art Director
DANIEL R. LEWIS, Western Manager L. P. SIEGEL, Production Manager R. G. GERMAISE, Circulation Manager
CHARLES A. BRESKIN, President ALAN S. COLE, Vice President

Subscription price $5.00 per year. Canada and foreign $6.00. Price this issue 50 cents per copy.  Published in U. S. A. Application pending for transfer of second-class entry from the Post Office at Easton, Pa., under the Act of March 3, 1879, to the Post Office at Philadelphia, Pa.

Member of CCA (Controlled Circulation Audit)

*Every*

## OTHER YEAR!

Two years produce many changes in the process industries. A man two years behind the times is no longer useful to his organization. Come to this year's Chemical Exposition to keep abreast of the advances and changes. It is the outstanding opportunity—a post graduate course in modern methods, materials and machinery for the process industries. It epitomizes years within a week.

*Note the date, note the place—*
*Come and bring your associates.*

# *15th* EXPOSITION CHEMICAL INDUSTRIES

**DECEMBER 2-7, 1935 • GRAND CENTRAL PALACE, NEW YORK**

MANAGEMENT INTERNATIONAL EXPOSITION COMPANY

MODERN PLASTICS

BRESKIN AND CHARLTON PUBLISHING CORP.

NOVEMBER 1935 VOLUME 13 NUMBER 3

# Cast and molded lamps, smartly conceived

BY E. F. LOUGEE

FOR some time we have watched the inchworm development of lamps in plastic materials. It seemed an eternity before anything of practical interest would be ready to report. A number of manufacturers have dabbled with the materials but along lines that must have been as discouraging to them as they were to us. No one seemed to grasp the fact that plastics are not simply something to take the place of metal or other materials, but are brand new materials with grand new opportunities for handling and design, ideally suited to decorative as well as practical adaptations in lamp manufacture and other decorative furnishings.

Just as we were about to give up hope, the All-Plastic Lamp Co. has created a table lamp and desk lamp that are really swell. Using regular stock forms (rods, tubes and sheets) of cast resins, machining and shaping them as one would jewelry, the desk lamp is about as good looking and useful as any yet designed for modern homes. A bracelet tube from which a one-third sector has been sawed lengthwise forms the shade. Its ends are sealed with discs of the same shade of material and the piece removed has been smoothed off at the edges and becomes a pen and pencil tray—an added accessory with small extra cost. The base and upright of the lamp are fashioned in interesting geometrical design from sheets of cast resin whose edges have been smoothed and rounded to give a pleasing finish. The assembly is screwed together rather than being cemented which adds to its permanence and makes it capable of standing reasonably rough usage wherever it is required. Students will appreciate this lamp for their rooms at college. It will come as a welcome relief from the cold glaring chromium affairs so freely offered by modern decorators in their search for straight-lined effects.

Add to the smooth clean appearance of cast resin, the translucent glow of warmth which illuminates it when the desk lamp is lighted, and you will appreciate the effect. Two bulbs give ample light for desk use without glare and the illimitable combinations of color available in cast resins give decorators an opportunity to meet the most exacting demands. Cast resins, you know, are made in many pastel shades as well as in white, ivory, clear and interesting mottles of every sort. By using conventional shapes available from stock molds, fabricating costs are kept low even

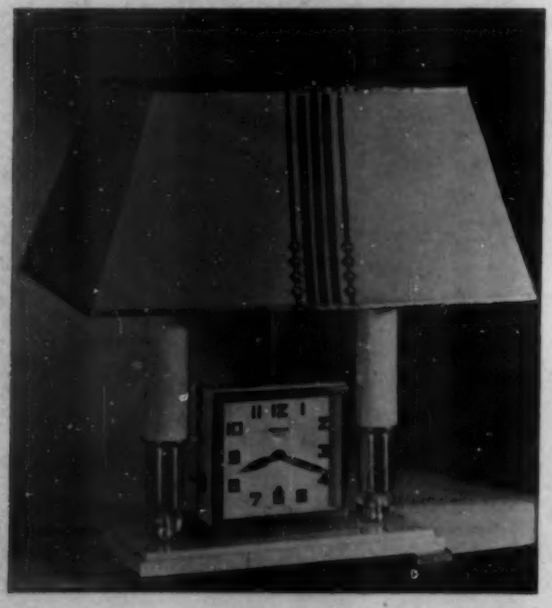
Smart modern desk lamp made from stock shapes of cast resins. Photo, courtesy of Marblette Corp.

in small quantity production. By combining colors, an almost limitless presentation can be made for consumer choosing without any increase in cost.

The table lamp illustrated takes ingenious advantage of the translucence of cast resins by concealing a bulb in the upright tube which adds a delightful glow to the whole lamp when it is lighted. The same type of bracelet stock is used in both lamps except that in the table lamp its position is reversed and serves as the upright of the base instead of the shade. Geometrical arrangement of large and small squares of sheet stock fastened together with screws form the base. A conventional shade of any material may be used in the usual way.

Lamp base cut from sheets of Marblette and assembled with screws. Upright is from bracelet stock the top of which has been sealed with a disc to match

Beneath, is the new Twinface Clock-lamp with Catalin base. Time and light combined for twenty-four hour utility



Marketing facilities are now being arranged. Single stores in key cities will be chosen as exclusive outlets and cast resin displays, showing the manner of construction and the utilitarian advantages of the material, will be made. Decorators, architects and builders will be offered individual designs for every purpose upon special order. The first two lamps used to illustrate this article, excepting the electrical parts, were made exclusively of Marblette for the All-Plastic Lamp Co. by the Ace Plastic Novelty Co.

A cast resin base is used also by the Twinface Clock Co. for its new lamp-clock combination which presents as its feature a clock with two separate faces that may be seen from either side of the fixture. This base is built of two separate sheets of Catalin and the framework of the clock is of the same material. Brass feet are used to harmonize with metal candle sockets which support the candle-like electrical fixtures and shade. These sockets rest on solid balls of glass and combine to present a lamp that is smart and modern as well as being useful twenty-four hours of the day. It also comes in chromium and black.

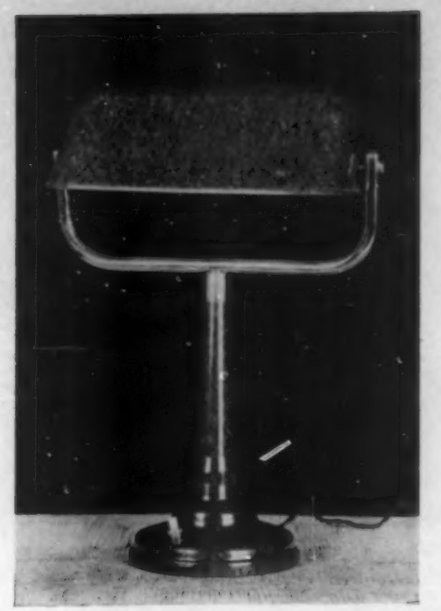
The neatest lamp trick in plastics, however, is an all molded lamp which comes from England. It weighs next to nothing and may be pulled and pushed about the desk without effort to give just the right amount of light where it is most needed at the moment. If it tips over, there is nothing to break, and its tiny push button switch of white urea is the most convenient we have ever used. The base is molded in a three-impression two part mold of the guided flash type, the moldings being unscrewed from the die. No holes are molded in as in some cases no switches are required and the molding in of the flex hole would delay production unduly.

The stems, which screw into the base, are molded in a guided flash mold, three at a time, and the job is so designed that the threads at both ends—though of different diameters—have the same pitch and moldings can be unscrewed easily from the top forces.

The molded shade presented some difficulty, according to a statement we obtained from England, and a special attachment for a horizontal milling machine has to be made to machine the die. Once the tool was made, however, no particular difficulty was experienced. These shades are molded one at a time under a pressure of 45 tons, and are coated inside with aluminum paint and lacquer which gives satisfactory reflection. Ranton & Co., Ltd., of Cricklewood, London did the molding and the molding material used was furnished by Bakelite Limited, of London.

The one we have is of mottled brown with nickel trimmings, but the possible combinations of molded materials is limited, only by the imagination of designers and manufacturers who create and produce them. Shades of translucent urea with lustrous black stems and bases of phenolics is just one suggestion. Pastel urea for boudoirs is another. How long will it be we wonder before these delightful lamps are made available in this country? How many students with homework to do are there in the land? Maybe a million. Maybe twenty-five million. And every one of them a potential customer.

In contrast to these individual lighting applications of cast and molded plastics, which are more or less



All molded desk lamp from England. Light as
← a feather but tough as nails

Lighting fixture, in the new Santa Fe Coach
↓ Club Car, of molded Unyte

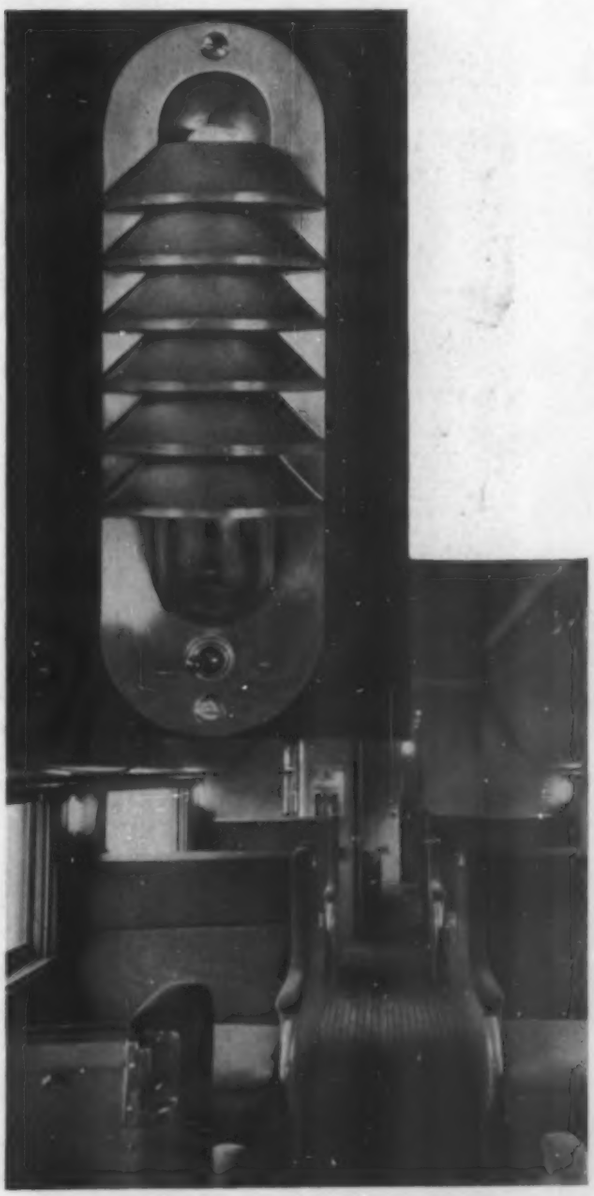
personal in nature, let us look at an interesting industrial example. Reading lights in the new Coach Club Car of the Atchison, Topeka and Santa Fe Railway Co., have shades of molded Unyte. Mr. Shepmoes of the Safety Car Heating and Lighting Co., who did the molding, believes that this particular type of fixture illustrates how molded plastics can be used to good advantage in the study of illumination. "In these fixtures," says Mr. Shepmoes, "illustration is more or less independent of translucency of the molded plastics since the light passes directly to the reading plane between the louvres. The purpose of the louvres is to shield the eye from the glare of the lamp filament. We now have in development some additional interesting applications of this idea using molded plastics for glare elimination and slight color value, but permitting light to pass without interruption from its source to the useful reading plane. The advantage of using molded plastics in preference to metal or glass would seem to be its slight translucency, more pleasing effect, and its durability in certain service conditions when compared with glass."

In the September issue of MODERN PLASTICS we ran an article called "Two-Timing Molds for Profit" in which we illustrated the important role molded phenolics played in enabling the Quaker Lamp Co. to perfect its new radio lamp. This lamp was designed to conceal a small bulb within an opaque base in a manner to allow light to be released only through a bubble-glass ball atop its base. When metal was tried it became too hot to handle and plastics proved to be the only available material that would not transmit heat. Being insulative, the material was not too hot to touch even after the bulb had been lighted several hours. No damaging heat reached the surface beneath.

The Quaker Lamp Co. avoided mold costs by conforming the design of its lamps to the established lines of standard trophy bases for which molds already existed. These trophy bases, molded of phenolics, were simply cut out at the top to accommodate the lighting fixture and drilled at the base for a switch.

Another advantage that lamp manufacturers obtain through the use of plastics is that of the natural electrical insulating qualities of the materials themselves. In molded parts, electrical connections—even bare wires—can be molded in without danger of short circuits and with considerable saving of time in assembly.

With these beginnings, considerable progress should be made in the near future. Surely, America is not lacking in ideas. Designers of consumer goods have made greater advances in this country than in any other. Lamp manufacturers have played an important and leading role in the advance of interior decoration in these past few years. With an increased understanding and acceptance of plastic materials there is no telling how far they will go.



Many of the plaques, pilasters, grilles and furnishings of this miniature castle are hand carved from cast plastic materials. Note especially the intricate details of the altar above and the organ pictured at the lower left

PHOTOS BY F. R. DAPPRICH

THIS ARTICLE AND PHOTOGRAPHS OBTAINED THROUGH COURTESY OF THE CELLULOID CORP.

# Colleen Moore's doll house and furnishings

BY COUNT LEON BAYARD DE VOLO

**This most exquisite toy in the world is elaborately decorated and furnished with miniature carvings and objets d'art fashioned from plastic materials. It indicates the possibilities of their use on a larger scale wherever magnificence is desired in interior decoration and design.**

TO WRITE about my work in connection with the "Doll House" which Colleen Moore built, and not mention her name first before all else is a task too hard for me or for anyone who month after month had the pleasure of working with her. The most magnificent and expensive toy in the world is a work of love. Miss Moore conceived and built the house with her own funds for the crippled children of the world. Its exhibition in American and European cities is expected to net these children more than a million dollars through proceeds obtained and distributed

through local charities in each city where it is displayed.

Critics have called the completed house a masterpiece in the world of art. I consider it a miracle of understanding admiration. The genuine enthusiasm which vibrated from the soul of Colleen for nine years kept all of us perfectly synchronized in one ideal object—to accomplish the best that was humanly possible. And this we did beyond any doubt.

Count Leon Bayard de Volo

I have enjoyed much experience in the cinema studios, since I came to California, making big things and small things for studio properties; things that were nowhere obtainable and for which no substitute could be tolerated. In this world of "make believe" where stories are frequently taken from almost forgotten periods of time and translated through the cinema into international entertainment, unusual properties are continually in demand. If originals exist at all they are held safely in museums where producers can not reach them.

It has been my happy privilege to reconstruct and build such properties and decorations, not alone for the companies in productions, but for the homes of many of their executives and performers. To say that plastics have been of tremendous help is an understatement. Many things have been attained by carving and staining bits of cellulose acetates and cast resins that could not otherwise have been accomplished at all. At least, without tremendous expense.

In making the Doll House only the finest materials were employed: marble, ebony, tusk ivory, silver, gold, platinum, jade, pearl, bronze, stained glass, cut glass, and genuine two, three and four carat diamonds. But when it came to reproducing an ancient wine table less than three inches high and chairs to accompany it with intricate carvings of infinite detail, we turned to these miraculous plastics which are easy to fashion and are in complete harmony with other precious materials.

The floors gave us a real problem. There never was an elephant born which gave us a piece of tusk ivory larger than eight inches in diameter, and everyone well knows that tusk ivory, the same as any animal bone, is subject to deterioration in time. With age, tusk ivory will change color and, of course, various pieces will change in as many various degrees according to the physical make-up and condition of Mr. Elephant during his life. This would make it impossible to construct a floor five or six feet square and expect it to remain uniform for centuries. Cellulose ivory is one chemical substance which has definitely won the battle waged between imitation and the real. I can actually and with certainty state that Lumarith ivory is far superior to the natural product, resisting longer and better the action of time and corrosion by parasites.

One other very important point to be considered in the making of the Doll House was the possibility of decorating and inlaying with silver, gold and hard enamel colors. While it is possible to carve real ivory and Celluloid alike and with the same tools, it is quite a different matter to gild and color tusk ivory with the same uniformity and permanency. Cellulose acetate materials may be stained with a paint having a solvent base and actually become permanent and part of the material itself.

Statues, plaques, furniture, ornamental vases, pilasters, columns and grilles throughout the House are largely carved and fashioned from plastic materials, as well as the organ, altar and pulpit in the tiny Chapel. Without these versatile plastics which constitute between 60 and 70 per cent of all materials used our task would have been tremendously difficult, if not impossible.

I shall never forget the day I brought the tiny Chapel organ complete in every detail and gave it to Colleen. Her eyes sparkled like those of a child to whom had been given a beautiful doll. A pure joy and excitement showed in every line of her face, in her pose—standing on tip-toe, twisting her fingers in her own inimitable way when under the strain of some deep emotion. She was a picture of indescribable sweetness.

"It is so beautiful," she said, examining its every detail, "that it just brings tears to my eyes." No one ever paid me a more exquisite compliment.

Floor, furniture and grilles in this tiny room are carved from plastics as are some of the ornamental accessories

PHOTOS, COURTESY WESTINGHOUSE ELECTRIC AND MANUFACTURING CO.

Sawing Micarta Doctor Blade

# Methods of machining laminated material

BY E. L. WOLFE

WESTINGHOUSE ELECTRIC & MANUFACTURING COMPANY

Machining Micarta Gear

LAMINATED phenolic or urea material in some cases is molded into the shapes desired and in other cases is molded into flat plate and machined to the shapes desired for the specific application. Owing to the versatility of useful applications to which this material may be applied, its uses have expanded rapidly during the past few years. This increased use has frequently brought demands, from those not familiar with the material, for information to enable them to handle it satisfactorily in their processes. The correct methods of handling laminated will result in more economical processing and will eventually spread its usefulness.

In spite of the vast uses to which this material has been put, the best methods of machining sheets, rods, tubes, angles and other molded forms are not generally known, and are confined largely to the actual users who, in many cases, have had to create their own technique by cut and try methods. It is impossible to lay down any precise rules covering the subject since many grades have been developed for particular uses where certain features in the material itself are required. Various requirements of flexibility, hardness, porosity, mechanical strength or electrical qualities or a combination of them, require slightly different methods in machining.

## General

Laminated plastic combines the strength of steel with the adaptability of wood and the insulating qualities of rubber or porcelain. It can be sawed, drilled, tapped, punched, milled or turned with ease. For the machinist who is in doubt he should make his set-up for any operation just the same as he would if he were about to machine brass or any of the soft metals, regardless of whether the operation be sawing, drilling, tapping, punching, milling or turning. This rule is valuable because it is easy to remember. But, for best results, it is wise to follow the methods set down in the following paragraphs.

## Sawing

Either bandsaws, circular saws or carborundum wheels can be used satisfactorily in sawing laminated sheets or forms.

*Band Sawing:* When making curved cuts on any thickness or straight cuts on material one inch and over in thickness, a bandsaw is used. Any good wood-cutting machine, rigidly made with a metal table, is suitable. The saws, ranging from ¼ to 1-¼ in. in width, depending on the thickness of material to be cut, and the curvature of the cut, will give good results when run at approximately four thousand feet per

minute. The saws should be of the bevel-tooth type with seven teeth per inch.

The teeth of the saw should be sharpened straight across and sufficiently set to make a cut at least twice the thickness of the saw, thereby giving it no chance to heat except by the contact of the teeth with the materials. Ball bearing guides should be used and care exercised to see that they are adjusted so that there is no possibility of the saw being set so far back between the jaws of the guides that it will smooth out the set of the teeth.

*Circular Sawing:* When making straight cuts on material under two inches in thickness, a circular saw will give good results. The all-metal wood cutting type of machine, with a movable table, will give good results on sheets under 48 in. square. For sheets 48 in. square and larger, a stationary table with a movable saw is desirable.

The saws should be 12 in. to 16 in. in diameter and run at a speed of approximately 3,000 R.P.M. Where saws are well guarded, they may be run at higher speeds with good results. For rough cuts, the teeth on the saw should be beveled, and for specially smooth cuts, a smooth saw with no set, similar to that used for metal, should be used. The saws should be made of high speed steel of the metal-cutting type with approximately seven teeth per inch. When sharpening the teeth, use a 20 degree angle right and left, which creates staggered points. This will prevent chipping of the edge of the material when sawing panels or strips. For especially hard materials of asbestos combinations, a specially developed carborundum wheel produced by a reliable manufacturer can be used to good advantage on a table with a movable saw.

## Turning

Metal cutting lathes should be used with high speed steel tools in turning laminated. Tool bits should be ground without any rake and should have plenty of clearance. Thirty degrees works well, but in some cases as much as sixty degrees can be used to advantage.

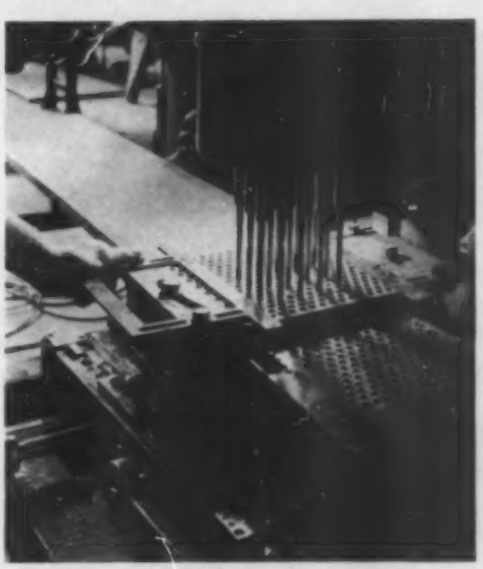
Where two cuts are taken, a roughing and finishing cut, about .010 in. stock should be left for the finishing cut. Very coarse feeds may be used, especially for the rough cuts. The speed should be between 200 and 400 feet per minute. If any of the tungsten carbide metals are used for bits, the cutting speeds may be increased, with a resultant decrease in tool grinding. If a diamond-pointed tool is used, the diamond should not be allowed to become too dull, as this will give a rough finish and may cause sufficient heating to damage the setting. In spite of the higher costs for tungsten carbide and diamond-pointed tools, they have proven economical on many classes of work.

## Drilling

For drilling, high speed drills with the lips ground off to provide plenty of clearance should be used. With subsequent drilling, the drill should be lifted frequently from the work to prevent excessive heating of the tool. This is (*Continued on page 62*)

Milling Micarta Bearing

Punching Micarta Washers



Drilling Micarta Suction Box Cover

# Cast resins in the making

**BY BISSELL BROOKE**

**AMERICAN CATALIN CORPORATION**

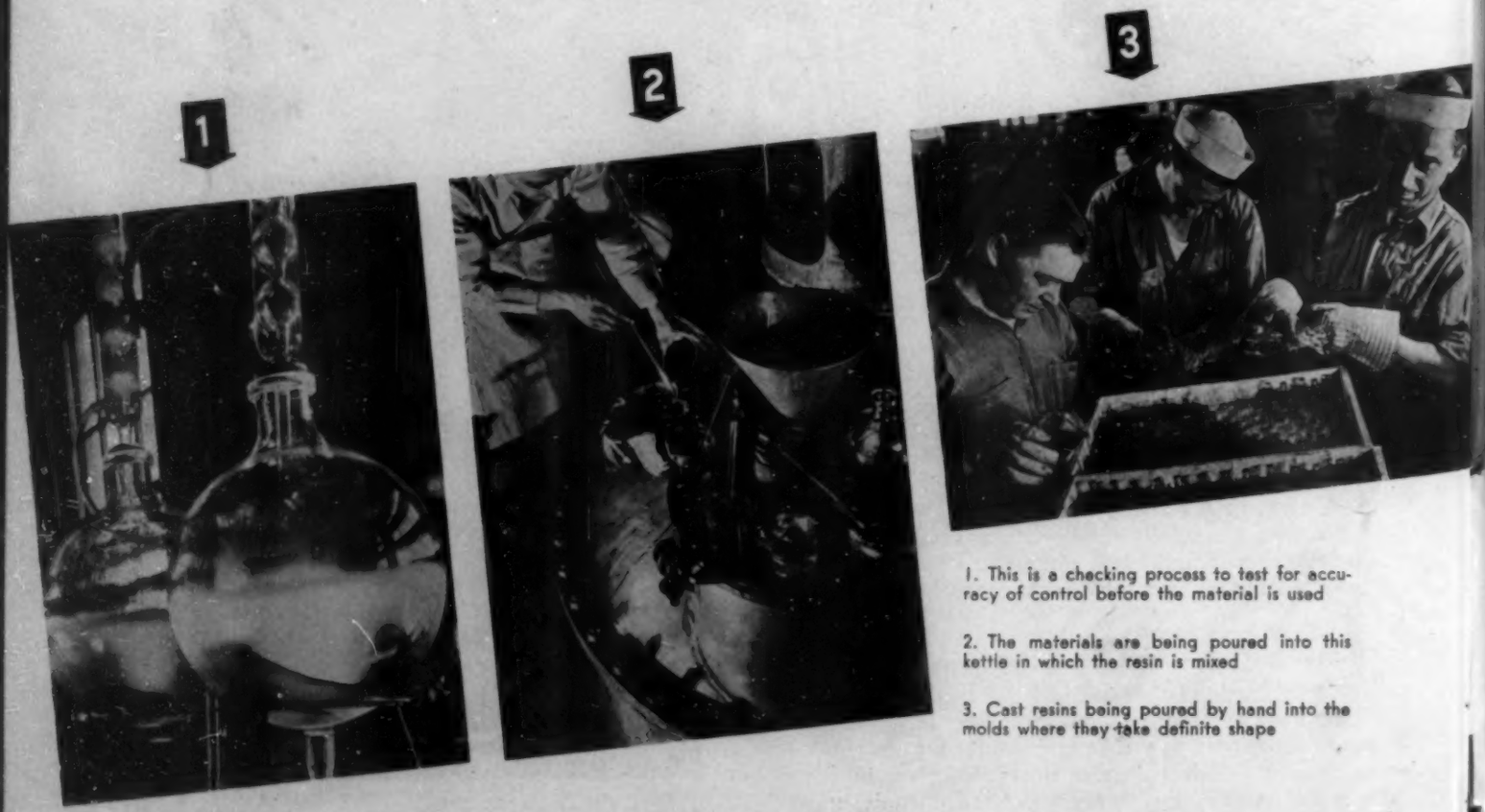
GRANDMA'S taffy and cast phenolic resins! Incongruous as they may seem, Grandma's taffy and cast resins in the making are analogous. The manufacture of cast resins is really a colossal version of making sugar taffy—the kind Grandma used to make, only it's baked instead of being "pulled." The processes are essentially the same but the ingredients are distinctly different. However, cast phenolic resins are better known by well established trade names, as the very popular material for costume accessories, household furnishings, gift and art objects, architecture, and machinery.

Almost everyone knows how taffy is made; but few have the slightest idea of how cast phenolic resins are produced. The making of cast phenolic resins follows a definite pattern, and is carried through mainly by mechanical processes.

The cast type of phenolic resins have been put to so many new uses, and such advances have been made in its production that last year between 4,000,000 and 4,500,000 pounds of this material were manufactured. Countless hours, time, and labor are involved in large-scale production. Every batch of the resin is carefully controlled during the time required in its manufacture. Shifts of men attend to bringing the resin from the liquid state—this lasts from 6 to 18 hours—through the casting and curing which involves from 3 to 6 days. Each batch is carefully timed, however, and heat and pressure are carefully watched. Chemists, like housewives, choose to learn by experience, and the history of each batch of resin is recorded in terms of temperature and pressure, and filed for future reference.

Great varieties in color, clarity, and mottling are required since much of the output of cast resins is used for jewelry and other decorative purposes. In order to control these factors, there must be a chemist in charge of each batch to control the time of each process, and to supply the various chemicals which give different finishes to the resins. A staff of chemists engage in the research, necessary to produce cast resin in types ranging from clear ivory to the very new and natural semblance of tortoise shell.

The ingredients of resin are no more numerous—though a bit more deadly—than those that Grandma used for the taffy. Phenol and formaldehyde are the chief raw materials; the others are distilled water, caustic soda and an acid solution to neutralize the soda. The chemists test these ingredients to be sure that each contains the necessary properties.




1. This is a checking process to test for accuracy of control before the material is used

2. The materials are being poured into this kettle in which the resin is mixed

3. Cast resins being poured by hand into the molds where they take definite shape

Phenol is delivered to the factory in special tank cars with a double lining, one of nickel and one of steel. The space between the two is used to keep the phenol at the right temperature for pumping. A nickel-lined pump carries the phenol from the cars to a glass-lined storage tank, also jacketed to control the temperature of the phenol, in the factory. Formaldehyde is stored in a similar tank after being transferred from a rubber-lined tank car. It is in the handling of these two materials, that there is a difference, phenol being carried through nickel piping and valves, and formaldehyde through aluminum.

Caustic soda, found to be a good catalyst, is dissolved in distilled water prepared in the factory. This solution is made up in nickel tanks, and a suitable acid solution, subsequently used to neutralize the soda, is mixed in earthenware vessels.

The resin is processed in a kettle that is scarcely even a distant relation of the old-fashioned whistling kettle, but more closely resembles a bathosphere like the one Dr. Beebe used to explore the ocean depths. The kettles vary in capacity from 400 to 2,000 pounds; but the majority produce batches of 1,000 pounds. Each has a nickel inner shell, and joints welded with fine silver. The dome-shaped cover projects through the floor of the charging balcony above. The nickel discharge valves are placed high enough above the floor, so that the finished product may be drawn off into nickel pouring buckets from which the molds are filled.

Every part of the machinery that comes in contact with the resin or the chemicals is made of nickel, while the outer jacket which encloses the kettle for heating or cooling is steel. On the casting floor level below and behind the kettles are condensers of cast iron with suitable cooling coils. Each condenser is connected at its inlet to the kettle goose neck, and at its outlet to a piston type of vacuum pump. These pumps are located on a balcony near the charging platform, and each is driven by an individual motor. Through their use, a vacuum of 29.5 inches is maintained during virtually the entire cooking cycle.

Each ingredient is measured in nickel weighing tanks on platform scales, from which they are run into the kettles. An overhead electric trolley handles the weighing tanks, and carries them to and from the kettle being charged. The newer kettles have flanged-mounted vertical motors for direct drive of the agitators, or stirrers, located above the center of the kettle.

Just as Grandma used to fret over the heat of her oven, so the manufacturers of cast resin guard the temperature of their kettles. A vacuum gauge and recording thermometers show the temperature of the contents of the kettle, and of the jacket—the heat being automatically controlled within 2 degrees C. Each phase of the process is scheduled, the changes between each phase are made by the operator who watches not only the completion of each phase of the cycle, but also the end point (*Continued on page 54*)

4

5

6

4. Thoroughly mixed and chilled the resin is drawn from the mixing kettle into a pouring pan

5. An arbor for making small rod molds is being taken out of the molten lead

6. A pneumatic air gun is used to loosen the cast resin from the mold

PHOTOS BY BOURKE-WHITE, COURTESY OF AMERICAN CATALIN CORP.

# Display that sells pens

**Sleek black molded phenolic frame with translucent urea ivory trays which become illuminated as the light in the sign flashes on**

WE ARE told that people buy more fountain pens than they used to. Sales figures are climbing steadily and there must be some good reason for this increased interest in writing equipment. Time was, we bought a good pen and used it until it wore out or got lost. One or two pens during a lifetime was considered a fair average. Now there are "Lifetime" pens guaranteed to never wear out and if they do, or become broken or messy, their manufacturers will make needed repairs or replace them without cost.

Why then, do people buy more fountain pens than ever before? It can't be because more writing is done now than in the past. Even if it were, pens made as they are today could not wear out more quickly than pens of a few years ago. No! There must be another reason. We suspect it is better merchandising.

Until a few years ago, our choice when buying fountain pens was limited to exceedingly few factors. We could, of course, have a fine, medium or coarse pen point; and a cap with either a clip on its side or a ring in its end. Our choice of color was easily satisfied so long as it was black. The pen we bought was all right and we liked it. Our first dissatisfaction popped up when we saw someone with a pen with a red handle. Ah! Something new! Something different. We must get a pen with a red handle, and we did. Then we had two pens where we had been satisfied with one before, and so it goes.

Within these past few years pen manufacturers (among others) have learned more about merchandising. Pens have been constantly improved. They have been made attractive to see and to use. Unique features have been introduced until it is now possible to get a pen that holds ink enough to last some time—and really holds it. It doesn't leak, and it is made so we can see just how much ink remains in the pen at all times. Pencils to match have been included in gift sets, and this brings up another point in merchandising which has had much to do with increased sales—*COLOR*. Pens, alone, or in combination sets with pencils to match, are made in a good variety of colored and mottled effects along modern lines.

Display methods have been brought into step, and any merchandise with pleasing combinations of color and effective display is half sold. This Parker Vacumatic pen display is one of the best we have seen lately. It has everything a good display should have to make it a successful selling agent. The base and upright are molded of black phenolic with display trays of ivory urea. The glass sign (which would have been less breakable and better looking if made of urea) is lighted by an electric bulb in the back which flashes off and on and also illuminates the translucent urea tray in the center. It also shows the transparency of the pen barrels and effectively demonstrates two major selling points of the Parker Pen—"Shows when to refill" and "Holds 102 per cent more ink." The pens are displayed with their points exposed—a new departure for pen displays. Gift boxes of matched sets appear on either side of the central display and all three sections are covered by glass. Parker Vacumatic Pens are thus brought forcibly to the attention of the look-and-run shopper and we shall be very much surprised if they do not take a new spurt in sales.


PHOTO, COURTESY OF CHICAGO MOLDED PRODUCTS CORP.

The use of plastics has a more subtle appeal to Parker than is indicated by this description of the display's utility, quality and permanence. Because of their world wide distribution, the cost per display is made to compare very favorably with that of much less desirable materials, in spite of the initial mold cost. At the same time the light weight of the plastic materials permits wide distribution and economical shipping to dealers in all parts of the world.

This display, designed by Paul Ressinger, is molded by Chicago Molded Products Corp., of Bakelite and Plaskon. The metal parts are furnished by the Kollman Case Co., who assemble the case and ship it direct from their factory to retailers upon orders from the Parker Pen Co. The display is 17 inches long, 8¾ inches high and 8 inches deep. Net weight is 6 pounds.

# Progress in powder packaging

BY EVE MAIN

A LITTLE less than two months ago Coty introduced "Air-Spun" face powder and presented it in an entirely new powder box constructed of paper and plastic materials. The box represents one of the most outstanding achievements in face powder packaging in many years.

Air-spinning revolutionizes and improves every aspect of face powder—texture, fragrance and adhesion. A new face powder formula is possible because the new process permits the use of superior ingredients which did not lend themselves successfully to former methods of manufacture. The salient difference in "Air-Spun" face powder is that it is made through the use of air pressure, whereby the powder is spun by air at a terrific speed, making 36,000 revolutions a minute. (The fastest racing car motor is capable of making only 6,000 revolutions a minute.) So tremendous is the speed and strength of air-spinning that the powder particles actually crush themselves against each other. Rushing torrents of clear, pure air swirl the powder until each tiny particle is buffed to pearl-like smoothness and flower-petal softness, assuring better distribution of color and perfume.

The air-spinning principle is exclusive with Coty. The old method of grinding powder, crushing it, and then putting it through sifters is now discarded by Coty even though it means scrapping hundreds of thousands of dollars worth of machinery installed within the past ten years and tearing up streets to install a costly electric system to get the type of current needed for spinning face powder by air.

The ethereal quality of the powder itself demanded package protection of a revolutionary nature. The box finally devised offers not only improved appearance but is absolutely sift-proof and its base of molded urea gives definite and permanent protection from moisture while the box is on display in shops or in use at home.

Coty's new "Air-Spun" powder box is tops in packaging ingenuity. Though it retains the familiar gold and white "powder puff" design so long identified with Coty powder, its improved construction has little in common with the previous box. It is a happy combination of paper, cellulose and molded urea resulting in a container that keeps powder fresh and fragrant for an indefinite period. (*Continued on page 57*)

PHOTOGRAPH BY BOURKE-WHITE, COURTESY AMERICAN CATALIN CORP.

# Renaissance in plastics

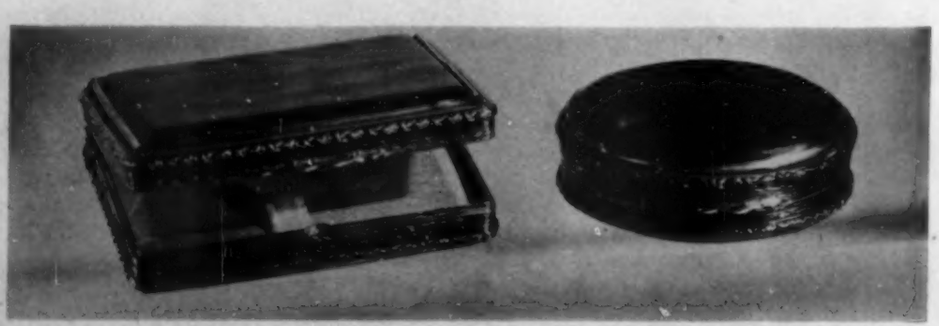
BY JEAN MAYER

THE Italian Renaissance which was at its height during the sixteenth century is perhaps the most famed of all renaissance periods for its progress in the plastic arts. At this time Benvenuto Cellini lived, a renowned artisan and goldsmith who produced some of the finest hand-carved jewelry, design and metal work the world has ever known. Specimens of his work are still to be seen in the collections at the Pitti-Palace in Florence. France in recent years created millinery, garments, jewelry and accessories which revived the style of the Italian Renaissance period. More popular knowledge of the fashion caused manufacturers to seek items that were typical of the times and among these, jewelry is outstanding even today.

Benvenuto Cellini in the early sixteenth century designed for a member of the famous Borgia family four magnificent tortoise shell cases decorated and finished with hand-engraved gold. Struck with their beauty and workmanship a representative of D. Lisner & Co., importers of jewelry, brought them to America to copy for presentation with its Christmas items in which a revival of the romantic era has been achieved with marked success.

When the point of manufacture was reached, Lisner & Co. was faced with the problem of faithful reproduction. The original tortoise shell and gold cases were entirely too expensive to have either selling appeal or practicability yet the Company was anxious to retain the shell and antique effect. The only wise thing to do, then, was to reproduce these cases in a material which closely resembled the originals yet brought costs within reach of today's market.

As the result of their research, they found cast resins available which so closely resembled tortoise shell in appearance and "feel" that they were ideal for the purpose. Four cases were made in practically the same size as Cellini's originals. The first was adapted as a cigarette case decorated in dull gold with a floral designed bar across the center of one side to keep the cigarettes in place. The semi-translucence of the material makes a (*Continued on page 57*)



# Cast molds may widen markets

**Considerable experimental work has been done recently with molds cast from beryllium copper and many interesting plastic moldings have been made. Cast molds, when they have proved their ability to stand up in the production line, promise possible savings where decorative design enters into molded objects and this article, secured from The Gorham Company, sets forth the experience of their development to date.—Editor**

WHEN the executives of the Bronze Division of The Gorham Company began studying new fields in which to apply their knowledge of the technique of producing fine castings in bronze, the possibilities of cast molds for the plastic industry became apparent, provided the proper alloy could be found. This alloy must give a fine, sharp casting and permit hardening, so that the resulting mold would have the general physical characteristics of the successful steel mold now in use. If such a mold could be cast, the opportunity for reducing the cost of many types of molds was evident. Sales and advertising managers would have a new sales medium carrying molded ornamentation for packaging, displaying and vending merchandise. New consumer premiums, sales and industrial prizes, and advertising novelties would be available, embodying trademarks, illustrative design and ornamental surfaces. New low-priced plastic articles, experimental models for new products, or parts thereof, would be possible at a fraction of the cost of present available materials and orthodox methods.

Could such an alloy be found? Would it withstand the temperatures, pressures, and other factors involved in molding plastic materials? An examination of the metal field disclosed interesting data. Of all the possible alloys, beryllium copper alone seemed to possess all, or nearly all, of the requirements.

The next logical step was to produce experimental molds. This was done at The Gorham Foundries, and limited production runs have been made. Beryllium-copper molds, it is claimed, may be cast with refined surfaces, suitable for the molding of plastics in practically all required shapes and forms in everyday use.

Sample pieces produced from cast beryllium-copper molds illustrate this article. These examples, especially the large box top, of which over 2,000 have been produced without indication of wear or fatigue to the mold, indicate the possibilities of the cast beryllium-copper mold in lowering the cost of producing many types of plastic pieces.

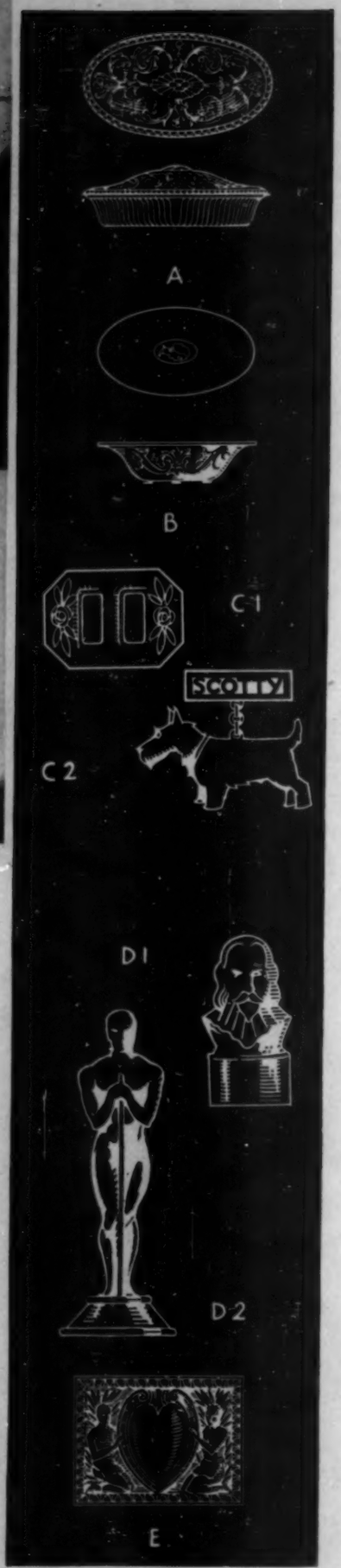
It requires but a small flight of the imagination to foresee the possibilities of plastics produced from cast molds. Visualize the possibilities in plastic decorative wall panels, moldings, portrait and pictorial reliefs in miniature and larger size, decorative table and desk tops, trays, ornamental lighting fixtures, window

At top—ornamental panel, 7½ x 30 inches, made to illustrate the adaptability of ornamental plastics to wall decoration. Beneath, are the mold and force, both cast for economy of molding material

↑ Cameo Silver Chest with molded cover 15½ x 11 x 1¼ inches. The cast mold is pictured above in a press at the Associated Attleboro Mfg. Co.'s plant where the covers are molded of Bakelite and Plaskon

transparencies, picture frames, signs, display letters, grilles, fraternal emblems, cameos, trademarks, new and delicately designed packages, closures and individual displays of various types. *The list is almost limitless, provided ornamentation is the keynote of its conception, and provided, of course, that cast molds live up to expectations in production runs.* With today's market crying for new merchandising aids, the advent of this new cast mold for both experimental and production runs seems timely and important. It should be noted in the preceding comments that few, if any, conventional applications are cited. It is in the development of other than the present-day conventional items, including highly-ornamented dishes, tumblers, window displays, packages, reuse containers, etc. that cast molds may widen the market for plastics beyond that now possible. For some time it has been apparent that the excessive expense entailed in securing even fair examples of figure relief in plastic has retarded the effective use of ornamentation in design.

Experience to date indicates that cast molds




**Ornamented and irregular contours where designed surfaces add interest to the plastic part are suitable subjects to consider for cast mold production**

A. Covered container elliptical in plan with irregular contours and ornamental detail. Suitable to innumerable applications in packaging when the nature of the merchandise lends itself to an ornamental and attractive container

B. An open dish, ornamental detail on outside, especially if elliptical in plan. By such shapes, plastics may be removed from the category of simple forms where their present method of manufacture has naturally placed them

C. Flat back ornamental pieces (as buckles, buttons and novelties)

D. Round figures having free draft (as bottle tops or advertising novelties) made in a two or three piece mold

E. Ornamental panels, (as wall panels, frieze, box covers or counter-display stands) involving any degree of refinement or detail and in any size up to and beyond the limits of existing press equipment

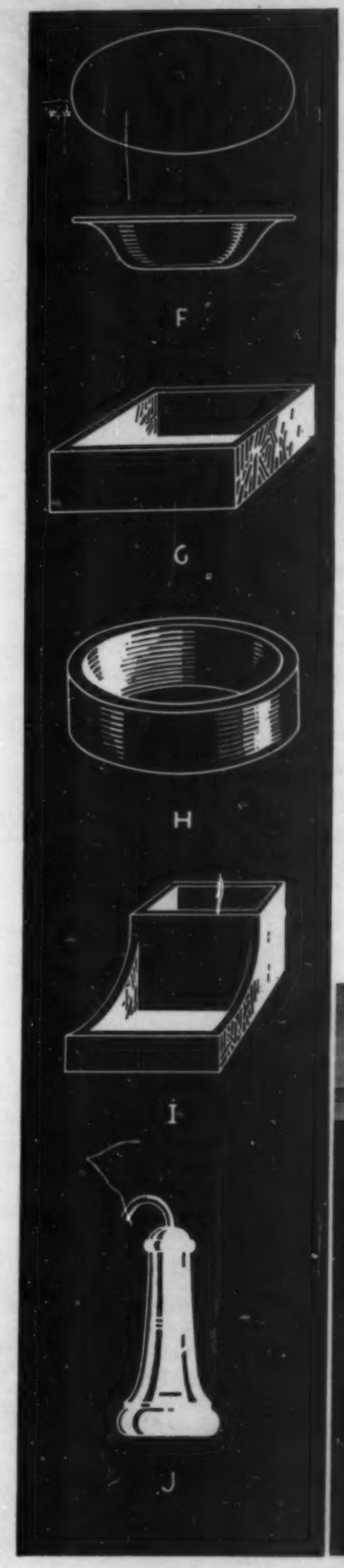
will not attain the importance they deserve in industry until the potential users give adequate consideration to the new and uncharted fields which the advent of the new mold may open for the more general use of plastic materials. Initially, it is likely that their limitations are certain to impress the average molder more than their extensive possibilities. Certainly, beryllium-copper cast molds constitute no cure-all for the problems of the molding industry, yet they promise to have a definite place in its future. In order that misunderstandings as to their proper use may be reduced, the following technical information is offered.

## Cast Mold Material

Beryllium copper is a heat treatable alloy which develops in the as-cast state after heat treatment, the following approximate physical characteristics:

Ultimate tensile strength—150,000 pounds per square inch
Ultimate compressive strength—190,000 pounds per square inch
Elongation in 2 inches—2%
Rockwell hardness—C40
Brinnell hardness—360

Its factor of thermo conductivity is approximately double that for steel, and its resistance to corrosive influences somewhat better than that of pure copper. No difficulty is experienced in chrome plating when required. In the hard-




**Plain shapes like these where smooth surface requirements are a deciding factor are not recommended for consideration with cast mold production**

F. Plain bowl without ornamentation or design

G. Plain rectangular container without ornamentation, if the surfaces must be extremely refined. Add ornamentation (as trademark or advertising message) and cast mold is suitable

H. A plain cylindrical piece, (as a cap, cover or container) where all surfaces are absolutely smooth and operations of machining a steel mold for it are basically simple

I. A plain simple piece (as an Ash Tray) is seldom suitable for a cast mold, because of the combination of surface requirements and the simple machining involved. On large pieces involving ornamental detail, cast molds may be considered suitable

J. Technical moldings (as a telephone receiver or ignition distributor head) involving smooth surfaces of a refined character and a high degree of accuracy

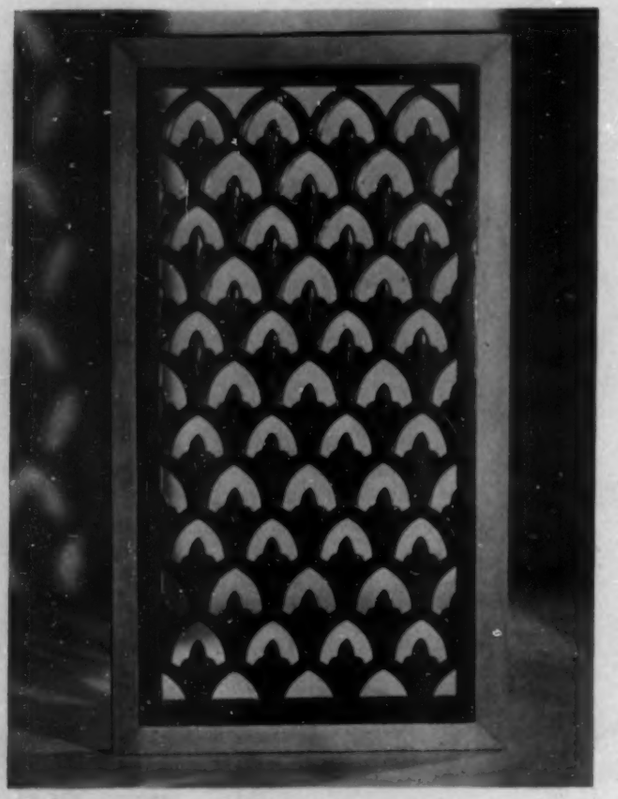
Arrentine plate, 7⅛ inches in diameter, 1 inch deep. Experimentally reproduced in ivory urea, from a museum piece, and toned to present an appearance of great age

ened state the condition is reported to be uniform throughout the piece and not restricted to the surface.

## Conditions Favorable to Cast Molds

*Where exact dimensional accuracy is not demanded.* Exact dimensional accuracy is not important on many custom molded articles. This is particularly true with most ornamental items, since their visual effect is more desired than the element of minute accuracy.

*Where ornamental surfaces are required, or exact adherence to modeled ornament is essential.* It is a recognized fact that the reproduction of ornament in a steel mold in all cases represents a difficult machining problem and that such an ornament must be included through a hob, or by cutting it into a mold on a die-cutting machine. Where there is a demand for a true and exact reproduction of an embellished surface such as a reproduction of a sculptural portrait relief, a die-cutting machine must be used to make either the hob or to cut the impression in the mold if the piece is to be in steel. In such cases cast molds offer an economical method of making an exact likeness of the original with considerable saving of time.



Frog ash tray, 4¾ x 4 inches, molded in one of the first cast molds. Four thousand pieces have been made without perceptibly affecting its finish

← Grille design, 10½ x 21 inches, molded experimentally in brown Bakelite to show the possibility of work of this kind

*Where irregular contours are encountered.* The machining operations required to make a mold for a plain cylindrical container are elementary and inexpensive. If such a container is changed to the shape of a circular bowl, it is apparent that the difficulty of machining is increased. If again the shape of the container is changed to that of an ellipse, machining presents real difficulties as the work must be transferred from the ordinary lathe to a die-cutting machine, and this holds whether the cavity is cut on the die-cutting machine or is made from a hob. These examples are cited to illustrate that the more irregular a mold contour becomes the more favorable is the application of a cast mold.

*Where molds are so large that hobbing is impractical and much material must be removed by machine.* In some cases cavities reach a size where the limits of hobbing press equipment prevent the use of that method for their execution. Even at intermediate stages it may be necessary to remove a considerable quantity of the material, "hogging" it out so to speak, in order to make possible the application of a hob. Under such conditions cast molds merit consideration because their size is apparently limited only by the capacity of existing molding press equipment.

*In flash-type multiple cavity molds using a flat force, even though cavities are small,* the cast mold may have considerable advantage, even where hobbing is not especially difficult, as a series of cavities can be cast in a single plate, not treating them as entities within themselves. Where this is possible the cast mold has the advantage of permitting the inclusion of a considerably greater number of cavities within a given area than is possible in the usual type of mold.

*Where steam or water circulating lines are required in molds for proper heating.* It is possible to cast such circulating lines integral with molds of this character and to place them in the most advantageous positions without involving any appreciable additional cost.

*Where thermoplastics are to be molded and quick temperature reversals are important.* Cast molds in beryllium copper, with or without circulating coils, will heat and cool at approximately twice the speed of steel molds having the same dimensions so that a reversal of any cycle is speeded materially.

*Where reproductions of existing surface textures are desired.* In certain cases it may be important to reproduce on a plastic surface a texture existing in another plastic piece, or one *(Continued on page 55)*

# Phenolics for '36 clocks

BY FRANKLIN E. BRILL
GENERAL PLASTICS, INC.

EVER since the famous molded clock craze of 1928-30, which ended as quickly as it started in a flood of imitation walnut Gothic Cathedralettes, clock manufacturers have been aloof and a little wary about using phenolic materials—so eminently suited to clock case fabrication. The Western Clock Co. did much to break the jam a couple of years ago with their black phenolic and gold, de Vaulchier-designed hand-bag watch and their other smart table clock, and the prospects for more phenolic clock cases in 1936 look excellent.

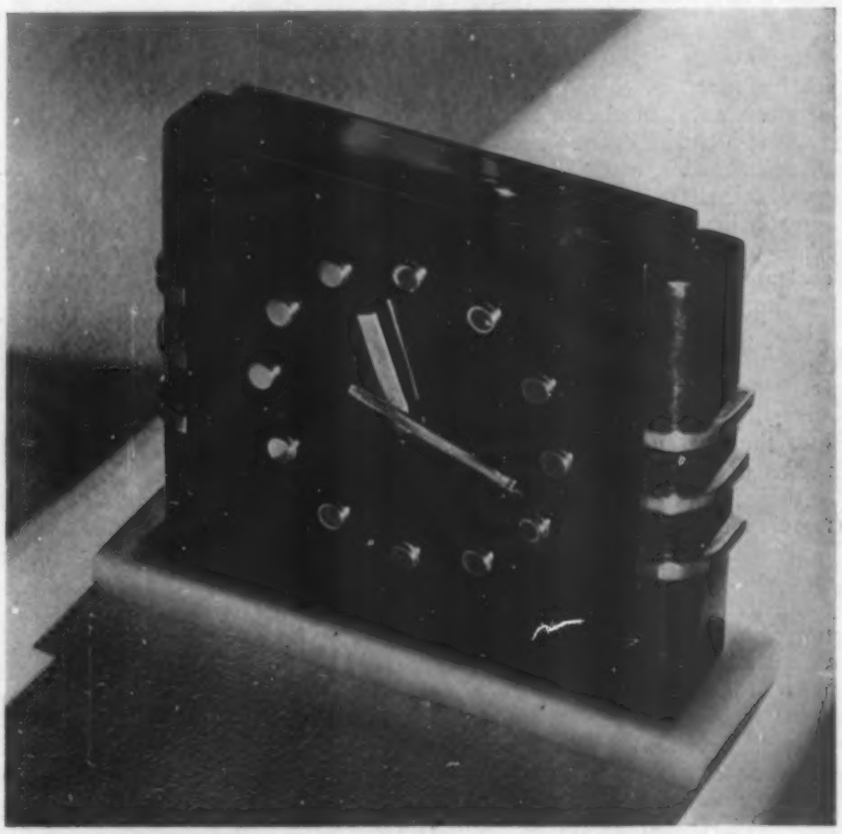
Phenolic plastics are unquestionably an excellent material for clock manufacturing—if properly used. Obviously, they must *not* be walnut or mahogany wood imitations; the public has put its foot down firmly on that. But they can be black with metal or pastel colored accents, cast phenolic dials and bases, or they can be brown or other dark colors with copper, orange or yellow accents. It is this combination of colors and materials which, we believe, will mean more clock case moldings during the coming year.

For after all, the crying need in America today is plenty of popularly priced electric clocks, to replace the time-worn and inaccurate time-pieces handed down from grandfather's day. Millions of wired homes are without electric clocks, and many other millions have only one electric clock where they should have a half dozen. What we need are not electrified tambours or coo-coos, but cleaner-looking, more easily dusted and more compact time-pieces to fit in with the newer and cleaner-looking furnishings and decoration in today's urban homes and apartments.

It would probably be idealistic to expect a really well-designed modern clock to come from every clock factory in the next few years, since Grand Rapids is still borrowing heavily from the Paris Exposition of 1925. But we can logically expect clock-makers to aim somewhere between the old Gothic dog-house and the too-highly-stylized, dial-less and almost handless affairs which look so smart in the movies but so incongruous in the average home. A moment's thought will show one that modern design can go much farther in accessories such as clocks than it can in furniture but it can't go too far—if one wants to sell the Middle West and other substantial home-loving communities.

We illustrate a new design for either a spring or electric movement clock, the main body of which is molded phenolic material. It was done by Joseph Frederico, Buffalo plastic designer, to show the versatility and adaptability of this extremely practical material. Federico's design is flexible enough for a whole line of clocks, since varying the units and colors permits the manufacturer to offer (first) several styles of mantel or table clock, (second) several color and material combinations, (third) kitchen wall models or hall clocks, by eliminating the base and equipping them with hangers, either for vertical or horizontal hanging. Only one mold would be necessary for all these variations as well as for a full range of colors.

According to Federico's outline, the designer primarily intended to reduce the cost of fabricating a smart looking, modern clock, also reducing the cost of preparatory tooling up. In the model shown here, the base is a flat slab of cast phenolic plastic, and the side bars are plated die-castings, which can be imbedded in the phenolic piece during the molding operation. The main case itself is one piece, with an inexpensive stamping to close the rear opening.



As an example of the flexibility of the design, it is said that the imbedded (*Continued on page 56*)

# Editorial comment

SIR RICHARD GREGORY, noted English scientist, at a recent conference of the British Association at Norwich remarked: "Science alone cannot save mankind from disaster, but its influence as the guide and expression of man's fearless quest for truth should help to shape the future, and give the civilized world reason to hope. Whether a scientific discovery is used for good or evil, depends upon the community. Science is continually pouring riches into the lap of man, but the use that is made of them is usually decided by others. It is an ironical comment upon modern civilization that the social reaction of scientific discoveries and their application is to increase not human welfare, but distress and unemployment. Our distributive and economic systems remain on a basis of a pre-scientific age, wholly unadjusted to the change and unable to bear the burden of the new and incredible abundance. Civilized man could, if he wished, now make the world one, instead of a number of conflicting parts in which statesmen seem to be unable to secure substantial cooperation."

From identical channels of science come a diversity of discovered truths, the diversion of which for the good or evil of humanity is a detail which too frequently lies within the control of those whose acts are more often governed by personal emotions than by cool and premeditated judgment.

Who, for example, associates the soft lustrous fabrics with which women are gowned at a happy gathering, with the hellish horrors of war which explode the earth and destroy humanity, sinking countless ships with their human cargo. Yet the materials that go into the making of certain fabrics and provide the means of wartime destruction are so closely related at their inception that diversion in either direction is merely a matter of the delicate choice of ingredients.

Who associates the bleaching of clean white sheets and pillow slips of one's bed, or the purification of water in swimming pools, with the death and ruination of health caused by war gas. Yet chlorine is used extensively for both.

From these same channels of science come the basic materials with which our plastics industry is concerned. These riches "are poured into the lap of man, but the use that is made of them is decided by others." It is to our interest that they be employed in peaceful and commonplace ways to increase prosperity and stability within our country. Substantial and dependable sources of supply have been established. Constant research, experiment, and development by individual concerns have brought these materials to a high state of perfection. Molders and fabricators have devoted years to establish a technique of converting them to the proper use and enjoyment of mankind. Plastics are not materials of the future. They are materials of today. Ready and waiting to take their appointed place in the growth and expansion of our industrial future.

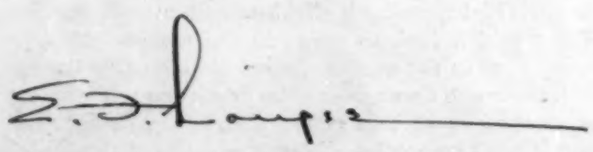
The use that is made of them lies within the province of industrial executives outside the plastics field. Men with vision to see in these new materials a greater opportunity to broaden their markets through the production of more desirable goods and with economies to themselves and to the men and women who buy their products. This use depends further upon the attitude of the men and women (often called consumers) they are created to serve. That this attitude is as moldable as the plastics themselves, is evidenced by the fact that wherever plastics have been intelligently employed to replace outmoded materials, their acceptance has been immediate.

Referring again to Sir Gregory's comment: "Our distributive and economic systems remain on a basis of a pre-scientific age, wholly unadjusted to bear the burden of the new and incredible abundance," we find long established manufacturing concerns with immovable notions and prejudices gathered during a half-century still making and attempting to sell outmoded products in a modern market inhabited by a new generation with utterly new ideas and preferences which it expresses freely in the things it buys. Our markets are cluttered with incongruous and grotesque objects manufactured with no consideration for appearance and without benefit of intelligent utilitarian design which would promote their sale.

On the other hand, we see the unmistakable influence of keen recognition and acceptance of established conditions in concerns whose greatest growth has been achieved during the depression. They have mastered the art of human analysis and learned to interpret this analysis into merchandise that is applicable to the times and conditions that exist, and which presents the elements of appearance and utility our rising generation demands.

To expect all industry to fall into line and take immediate steps to employ these new materials made available by science would be absurd. The plastics industry itself must become sales-minded as well as engineer-minded if it is to progress. Styling and merchandising enter as closely into the business of molding and fabricating as they do into any other business which caters to the constantly changing fancies of our restless public.

"Science alone cannot save mankind from disaster, but its influence as the guide and expression of man's fearless quest for truth should help to shape its future, and give the civilized world reason to hope." Nor can plastics alone save industry which shuts its eyes to the panorama of progress being made by civilization, but it is ready and available to those manufacturers who are determined to meet modern demands with modern ideas and modern materials. Such manufacturers, upon declaring their intentions, will find trained staffs of technicians in every branch of the plastics field willing and anxious to serve them—whatever the problem may be.



# Cocktail hour

NO GREATER joy enters our brain-weary lives than that occasioned by jovial friends who drop around for a convivial hour or two of cards or just homely conversation. It robs the evening of that weary time when, the newspaper disposed of, we are too frequently inclined to rehearse mentally the irritating events of the day and lay ambitious plans for tomorrow which we take so seriously that they keep us awake half the night after we have gone to bed. We welcome these informal interruptions and immediately become the genial host, solicitous of the comfort of our guests, wondering the while whether they will prefer Manhattans or Martinis and hesitating to ask until we get a chance to slip into the kitchen to learn whether we have the mixings for either refreshment.

Relieved to find a full bottle and a half of Booth's best and to learn that Martinis are acceptable there is no greater satisfaction at this point than to have a cocktail shaker of generous capacity without a sprinkler top that gives a shower of precious liquid which increases in volume with each vigorous shake. Home bartenders, who gained their experience and developed their technique during the days of Volstead were for a time insensitive to appropriate equipment. Cocktails of bathtub gin could be as well shaken in a milk bottle or fruit jar as in the most modern chromium contraption and at the time were considered swell. But in these days of Fuerst, Loewy, Dreyfuss, Teague and others, we have changed our entire attitude toward the requirements of gracious living and entertaining. We have been shown that those days of incongruous utensils were of an era through which we have successfully passed. They are definitely behind us never to return, we hope.

In order to drop the last vestige of those memories and to impress our friends (as well as ourselves) that a new order has been established we have informed ourselves as to the proper shapes and sizes of serving glasses for the drinks we prefer and have set in a supply of those best suited to our repertoire of recipes. We have even refreshed our memories about the proper temperatures at which to serve wines. New serving plates and trays for midnight snacks have been added that our pantry might not find itself unprepared for guests however unexpectedly they might arrive or at what hour.

We have become aware that the cocktail shaker is an indispensible necessity in the well ordered house. It must be of ample size to serve several guests and if a dividend remains, so much the better. It must be good looking and present an appearance in keeping with evening clothes and modern furnishings. And if it is smart, it will have a plastic molded top which screws on to the frosted glass base, and a tightly fitting shower-proof cap like these patented and introduced recently by Owens Illinois Glass Company which are pictured here. They are designed by E. W. Fuerst with special consideration for convenient and practical use, having strainer bars molded into the top in a manner which prevents fruit pulp and crushed ice from causing a jam at the neck of the shaker to retard pouring. The molded tops come in several colors to please those with marked color preferences who must have matching accessories on every occasion. Of course, one of the nice things about molded plastics in such applications is that alcoholic beverages and fruit juices have no effect upon them nor do they impart any metallic or foreign flavor to the drinks. Another thing, they have no sharp edges and are simple and safe to clean.

For those evenings you spend alone with your pipe and a book, the Owens Illinois folks have devised a tobacco humidor that is distinguished for its splendid design as well as by its molded plastic cover which is shaped to fit flush with its circular sides. Durez and Plaskon are the materials used in making these tops which are molded by Closure Service Company.

PLASKON

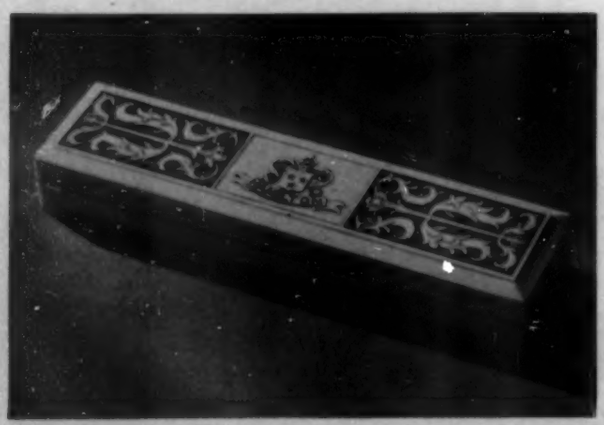
## WATCH BOX:

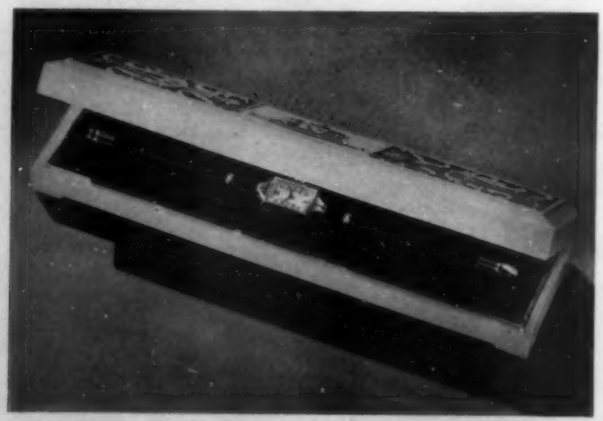
It's no secret that the Hamilton Watch Company was, at first, opposed to the plastics for its new display box. Hamilton customers expect and get the best in "the watch of railroad accuracy." Hamilton dealers—from Cartier down—are alike in disliking a display box that might disturb traditional jewelry store atmosphere. Of these facts, the company was acutely aware. Plus the private opinion that it had yet to see a plastic able to uphold Hamilton quality and prestige.

Today the Hamilton Watch is packaged in Molded Color—and a finer package it never had. Immediately, completely, the new Plaskon container registered. In the wide praise that has come, Plaskon's colorful beauty—caught here in lovely antique ivory—has figured largely. As has its faithful reproduction of the unusual cover design, and its protective strength. That this new box has changed the direction of fine jewelry packaging and helped Hamilton to re-assert its leadership are facts in which Plaskon finds pride.

Your product may need a Plaskon package that identifies it "of the quality" . . . that assures all selling and protection benefit. If it does, you should know more about Plaskon and its record, and its limitless Molded Color range.

The Hamilton Box is molded in a special antique ivory by the Armstrong Cork Company, in Lancaster, Pennsylvania.





# MOLDED COLOR

# NOVEMBER 1935

## CLOCK TIMER:

Last month it was the Toledo Scale cover, one of the largest molded plastic pieces ever made. This month it is the casing of the Hotpoint Clock-Timer. Next month, as certainly as Christmas, will see other products improved by the use of Molded Color.

The handsome Clock-Timer is an important, exclusive accessory of the New Era automatic elec-

tric range, a new model in the Hotpoint line. Its single piece Plaskon casing is molded in French gray that will remain permanently colorful . . . that will not check or peel or chip. And as Plaskon is strongly dielectric and a non-conductor of heat, the mechanism is fully protected.

For jobs big and small design engineers rely today upon Plaskon—knowing that its light weight, low cost and modern color beauty are production and sales aids obtainable in no other quarter. This particular job is molded by the Plastics Department of General Electric.

## CLOSURE:

Jigger caps in Molded Color are a favorite double-duty closure. Their brilliant color spots the package on the crowded shelf and carefully protects the merchandise. And in stadiums, or where you will, they do yeoman's service when the bottle makes the rounds. In the case of Old Mr. Boston Orange Gin, Plaskon was able to render threefold service. For it was an easy matter to select a Plaskon orange to match the color of the invigorating, tasty contents. Molded by Colt's Patent Firearms Mfg. Co. in Hartford, Connecticut.

TOLEDO SYNTHETIC PRODUCTS INCORPORATED

TOLEDO · OHIO

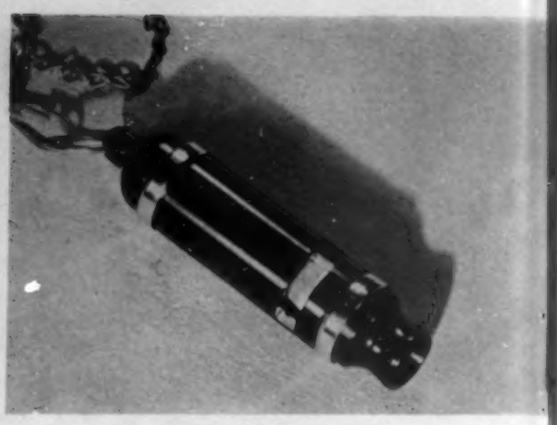
1


2

3

4

5



6

## developments of the month

1. For industrial processes generating organic vapors, and gases, smoke, etc., where the health and comfort of workmen are endangered, the E. D. Bullard Co. has developed this cannister type mask. The inhalation fitting is reinforced with Durez resin impregnated black canvas which gives it amazing impact strength, yet it is lighter than any metal and is unaffected by fumes and acid vapors. Photo, courtesy of General Plastics, Inc.

2. Kenneth S. Mack designed this textile sample book which is made up by the Plymouth Sample Card Corp. He achieved a distinguished effect with long time usefulness by using Lumarith covers imprinted in gold. It is impressive in appearance and uncommonly practical in that it may be easily cleaned with a damp cloth. Photo, courtesy The Celluloid Corp.

3. Twinlace Clock Co. present its Twinmill Clock with a chromium windmill scene in silhouette against a molded Bakelite case. The windmill serves as a manual starter and rolls merrily along as the clock runs. Ivory, green, blue, white, red and black offer sufficient color choice for any kitchen. The light colors are enamel applied over the Bakelite case.

4. Experienced architects and designers, working for the PWA, have in their efforts to clean up the city, created handsome, modern news stands at Sixth Ave. and 42nd St. and at Sixth Ave. and 32nd St. Shiny black Bakelite laminated (Formica) sheets combined with bright brass trim, replace the incongruous frame structures so familiar to New Yorkers in the past. These two modern booths are only the beginning of PWA plans. Modernization will extend to police booths, bootblack and refreshment stands. Photo, courtesy of Bakelite Corp.

5. Newest in combination cigarette cases and lighters for automobiles is the "Revelation Lighter" manufactured by Mastercraft Products Co. for Brown & Williamson. Easy to install, the case holds twenty cigarettes. Press the lever at the bottom of the box and your cigarette is lighted—all ready to smoke. Except for the electrical mechanism and metal clamp, the entire unit is of black Bakelite molded. Photo, courtesy of Bakelite Corp.

6. Every child will want one of the new "Referee Whistles" made by the Toy Division of the Waterbury Button Co. This item is the latest addition to the company's line of Bakelite molded toys. With its two tones, the gleaming black whistle is similar to standard referee whistles. Photo, courtesy of Bakelite Corp.

7. An unusually shaped electric iron which features some new ideas in iron design, has been announced by Robeson-Rochester Co. An exceptionally comfortable handle molded of black Durez is slanted and shaped to fit the hand and reduce the muscular strain. The long stream-lined nose is specially designed to iron around tucks and large buttons. A molded switch regulates the

heat and the iron sits on its heel when not being used, eliminating the usual stand. Photo, courtesy of General Plastics, Inc.

8. Miniature decorative flowers and earring buttons are being molded for manufacturing jewelers by Synthetic Moulded Products, Inc. from stock molds of its own creation. The moldings are intricate and colorful and are styled to the current demand for costume jewelry.

9. Lurelle Guild has created this new attractively designed whistling teakettle for the Aluminum Cooking Utensil Co. It is made in bright aluminum with a lustrous black heat-resistant Bakelite molded for the handle and whistle appurtenance. There is no lid to bother with and the kettle can easily be filled through the wide mouthed spout. Photo, courtesy of Bakelite Corp.

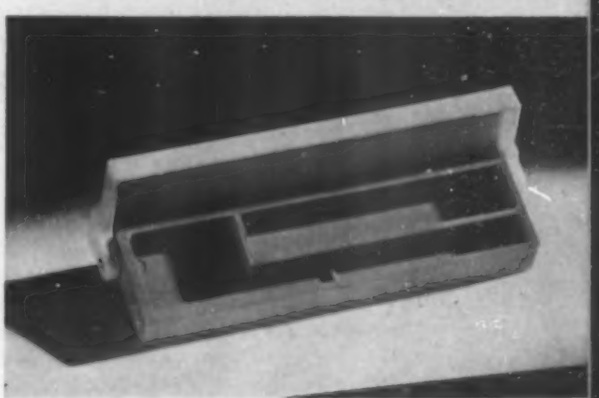
10. Irresistible Eyes, an attractive molded mascara box has been chosen by Irresistible Inc. for milady's dressing table. With a top of yellow Beetle and a bottom of green Bakelite this little box is divided into two sections, one large enough for the brush and the other just right for a cake of mascara. The case is compact and light and is a charming accessory of feminine makeup. Molded by Mack Molding Co.

11. This new contract duplicate bridge board is easy on the cards as well as the eyes. It does not glare like metal and is more substantial than those made of paper. Thirteen cards slip easily into each of its four grooves and the sixteen boards which comprise a set, are numbered and positions indicated in a contrasting color. Molded of black Bakelite by the Auburn Button Works Inc., for D. F. Haverstick.

12. A visor for windshields to protect the driver from the glare of night and day driving has been placed on the market by The Geist Co. Made in two sections, the smaller one is a light transparent green used for protection against automobile lights while the larger of a darker green is used against the glare of sun and road during the day. Easy to install and made of Celluloid this visor is of distinct advantage in overcoming some of the hazards of driving. Photo, courtesy of Celluloid Corp.

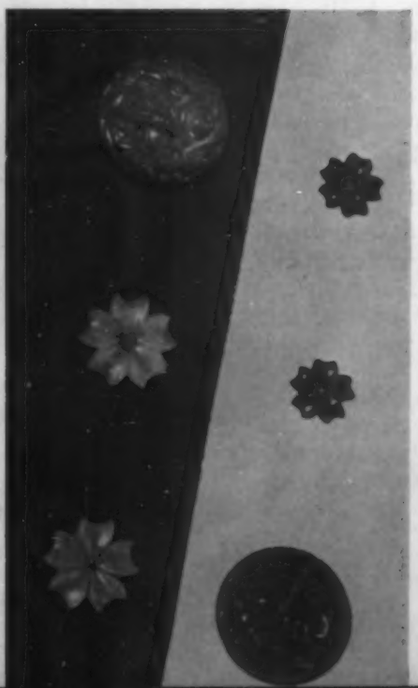
9

10

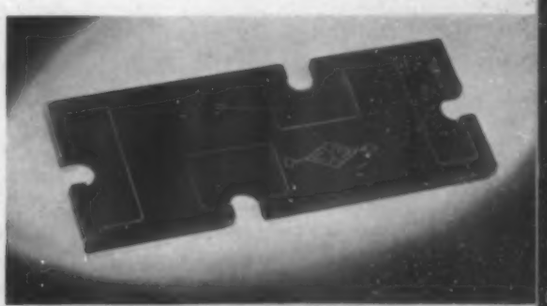


7

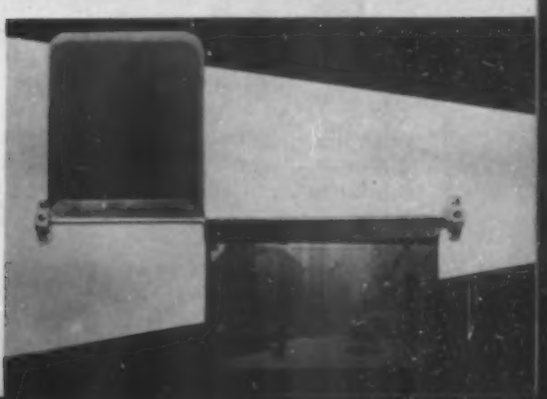
8



11

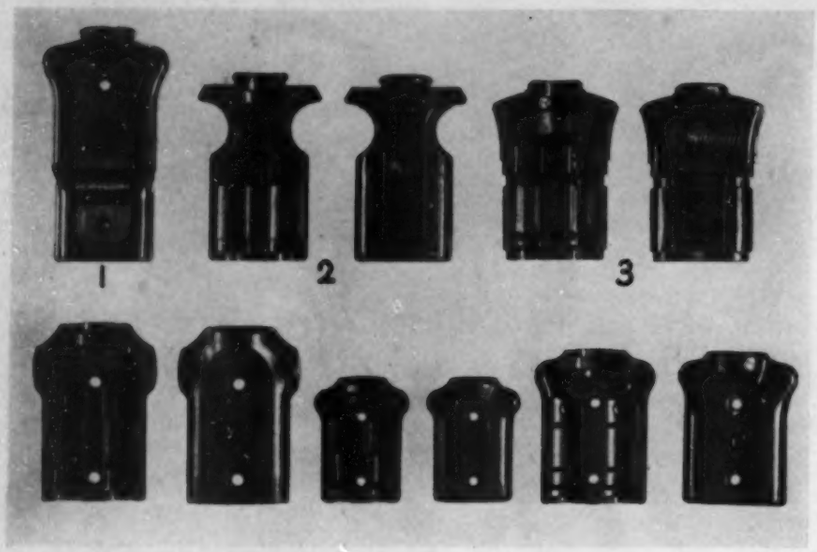


12



# Electrical heater plugs

BY HERBERT CHASE, M.E.

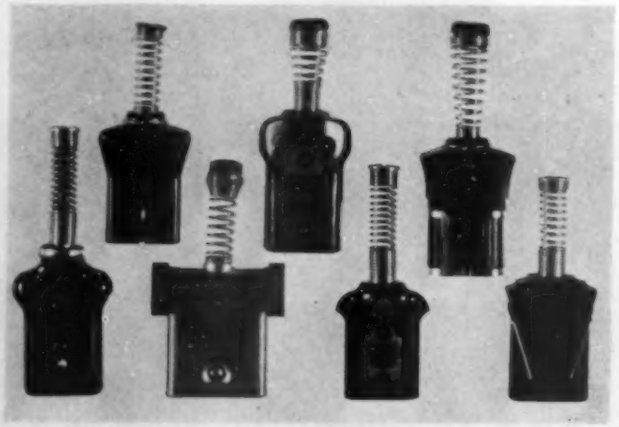



Molded shells for heater plugs produced by General Electric Company. No. 1 is hot-molded Textolite No. 70 containing an asbestos filler. It has the advantage of low cost and glossy finish but does not withstand temperatures as high as the cold-molded compounds from which the other shells are produced. Shells numbered 2 and 3 are made from Cetec No. 1389, a high-grade compound affording a good luster for cold-molding materials. It withstands temperatures up to 250 degrees C. (482 degrees F.). The remaining shells are molded from Cetec No. 74, which also withstands temperatures of 250 degrees C., but is not quite as strong as No. 1389 and has a finish less glossy

COMPARATIVELY few molded parts used in the electrical industry are as widely produced in great quantities as the heater plug required with every flat-iron, toaster, percolator and other electrical appliance for the home. Although the number of wholesale purchasers is large, it is probable that only a small percentage knows how to specify a good plug or how to determine whether it meets their specifications when delivered. Unfortunately, for the user as well as for the molder of plastic parts, much purchasing appears to be done on a price basis, with the result that the user is put to endless annoyance because the plug breaks easily in service or fails to perform its function for some other reason. The molder may be compelled to use an inferior compound in order to make even a small profit, but there are other faults in plug design and construction over which the molder has no control, for as a rule he merely produces the moldings from a design furnished and is not responsible for the metal parts which make up the remainder of the plug, and which often cause failures in operation.

Although frequent causes of complaint result from breakage or other defects which prevent safe and satisfactory functioning, there are cases on record where serious injury and even death by electrocution have been brought about by poor plug design or construction. This is an important reason why those who purchase heater plugs in quantity should assure themselves of a safe, well-designed and well-made product. It follows, of course, that they should be willing to pay a fair price that will enable the molder to use good materials, to do a good job of molding and to make a fair profit for his efforts.

Consideration is given here primarily to the molded parts of heater plugs, but adequate specifications will, of course, include proper consideration of the metal parts as well. Those concerned with specifications will do well to study carefully the ones prepared by engineers of the Electrical Testing Laboratories under the auspices of the Appliance Committee of the Association of Edison Illuminating Companies. They are entitled, "Specifications for Appliance Plugs for Domestic Flat-irons and Appliance Plugs for Electric Table Appliances." They cover such items as safety, effectiveness, durability and convenience. In other words, they deal with performance rather than with details of material and design, as both of the latter can be varied considerably and still give satisfaction in service. Within reasonable limits, almost any heater plug which is made from any of several good materials and is designed with proper care by one who knows the conditions to be met in service and who makes an honest effort to see that they are fulfilled, will come within the specifications. (*Continued on page 60*)

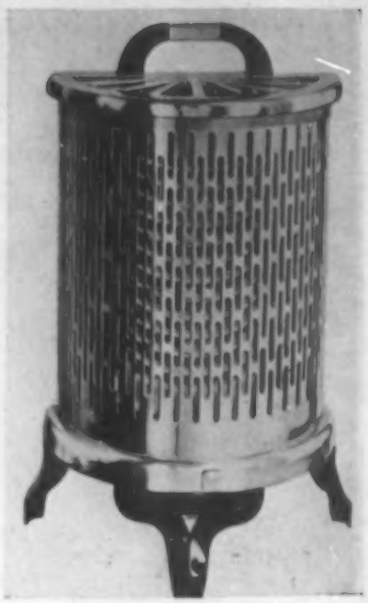


Assembled heater plugs which include nearly all the elements of good design mentioned in the text and which, among many other makes, meet specifications drawn by the Electrical Testing Laboratories. Both hot-molded and cold-molded types are shown

# New handle prompts redesign

BY DON MASSON

BAKELITE CORPORATION



CALIFORNIA, land of sunshine and blue skies, is not without its chilly days. Seven years ago Wesix, Inc., San Francisco, started to manufacture a small, portable, auxiliary, electric air heater—one that would be suitable to rooms where a certain amount of heat was required during the winter months.

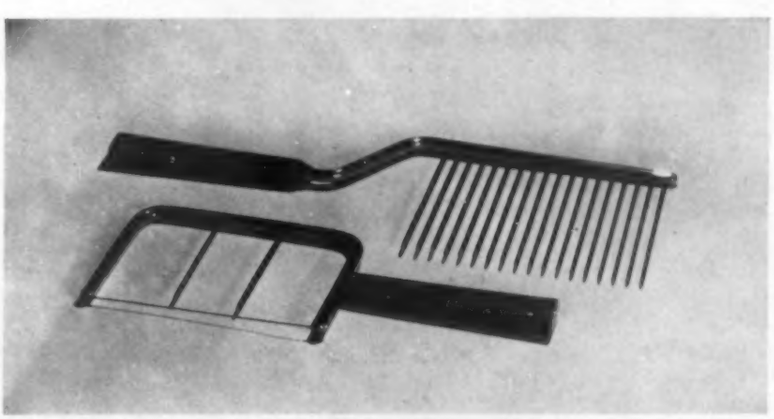
Due to the amazing public acceptance of this new Wesix electric heater, the company decided this year to expand its sales efforts into the eastern states. Electric heaters used to be looked upon as a boomerang by the public utilities and the electric dealers throughout the country. No one seemed to be able to make a heater that was any good. The fault was due to improper sales procedure, as a matter of fact. Electric heaters were sold in much the same manner as table appliances, with no thought given to the customer's heating problem.

There is a difference between spot type heaters and heaters which radiate heat throughout a room. Wesix is a radiant heater. It circulates warm air at a normal velocity without the aid of fans or other moving parts.

When it was decided to expand the sales program on a national basis, the company also decided that the heater should be restyled to conform with modern design trends in electrical appliances. The first step in redesign was the adoption of a new, lustrous, phenolic molded handle with metal trim. The molded handle replaced the former spiral metal handle, and special heat-resistant material was used. The new handle not only proved to be ideal from a utility standpoint, but it also greatly enhanced the appearance of the heater to such an extent that the balance of the heater was redesigned to conform to the shape and style of the handle. In spite of all this, the heating characteristics and the efficiency of the heater were not altered in any respect.

The new Wesix heater is sturdily built of rust-proof, non-corrosive aluminum. It weighs less than the average electric iron—only five pounds and three ounces. The heating capacity is 1250 Watts and the device operates from any 110 volt outlet, and retails at a popular price. The phenolic handle is Bakelite.

---



# ...speaking of handles

DO PLASTIC proponents lay too much stress on the merits of plastic parts when measuring the sales success of their products? The answer may be obtained by a study of those products in which plastic parts have replaced other materials. If sales have increased after the change, plastics deserve some credit. If sales have remained the same or fallen, plastics might get the blame. In the experience of C. J. Schneider Mfg. Co., cast resins are frankly given credit for splendid and immediate increases, and their success in an initial application has widened to include a number of the company's products.

For a number of years, this firm has manufactured two items of gift cutlery; a cake breaker, and a cheese slicer, both novel in their construction and efficiency. The cake breaker is a many pronged utensil with its handle at right angles with the prongs. Inserted in a cake, the instrument separates a neat slice without crumbling. It works well even on fresh warm cakes impossible to cut with a knife. The cake breaker, it is claimed, will provide wafer thin slices totally free from crumbs and with the most delicate frosting intact.

This cake breaker has always earned its measure of sales in gift and department stores, but when the Schneider Co. changed its handles to cast resin, sales shot up until it became a (*Continued on page 59*)

# Successful British premium

**Reuse packages have been with us some time but we seldom see one as practical as this which because of its peculiar construction can be reused with none but the original product**

THE prominent part that plastics are playing here and abroad in the premium, packaging and display fields is steadily increasing as manufacturers become aware of their outstanding characteristics. The beauty of plastic materials, the permanence of their lustrous surfaces, the elimination of finishing and polishing operations in manufacture, the detail work obtainable, the wide range of colors that are applicable, and the shock-resisting qualities are fundamental advantages which make these materials well adapted for extensive use in these fields.

Johnson and Johnson, British Division, well-known manufacturers of Baby and Toilet Powder, are giving an attractive molded urea container free with every two cans of their Baby and Toilet Powder purchased through chemists.

When this scheme originated the problem put before

the molder was the production of a container suitable for the dressing table, which could only be used for holding Johnson and Johnson's product; thus the molding had to be made so that it would accommodate only their standard metal can—and no other. As a result of close cooperation between the company and the molders, the container was evolved to satisfy the conditions imposed.

The metal can is pushed into the molded container from the bottom and is held in place by a spring clip. The sprinkler top fits into the top of the molding and is covered by a molded lid when not in use.

The new container is built along modern lines, smooth and shining, and is offered in black with a white lid, white with a black lid, blue, green, yellow and a translucent mottled pink. Mothers like the clean, sleek appearance of this new container and it can be washed and kept clean with soap and water without rusting. It is harmless for baby to handle and bite. The molded lid fits tightly and prevents powder from spilling.

It is one of those premiums which lasts indefinitely —and since no other can but Johnson's will fit into it, a continued use of Johnson's powder is necessary to its useful service. Venturing into the premium field in this clever way has enabled Johnson and Johnson to overcome any existing objections to the printed matter on the can as far as use in the home is concerned. The container fits any surroundings.

An attractive set-up display tells the advertising story graphically and the colorful urea containers form the center of attraction. The scheme, as may be expected, is going very well and up to the present time the Streetly Manufacturing Co., Ltd., who are making these, have supplied a quarter of a million. The materials from which the molding is made are Beetle and Scarab.

**This Johnson and Johnson container as well as many other English and German moldings showing interesting new applications of plastics is on display at MODERN PLASTICS, 425 Fourth Avenue, New York. The exhibit has aroused so much interest among designers and manufacturers that it has been extended to give those who care to see the moldings ample time to do so. Open from 9 to 5 daily.**

Miner's lamp molded of black TENITE
by Koehler Manufacturing Company

# TENITE

withstands hard knocks that would shatter ordinary plastics. That is why Tenite was chosen for the housing and switch parts of the Wheat miner's lamp. For many other uses demanding extreme toughness and shock resistance, Tenite has proved the ideal plastic. Send today for samples and booklet on Tenite uses.

**TENNESSEE EASTMAN CORPORATION** *(Subsidiary of Eastman Kodak Co.),* **KINGSPORT, TENN.**

# NEW IDEAS

● Storage battery containers must be made of a cheap material in the highly competitive market of today, and yet buyers expect high grade performance. Asphaltic compositions meet the demand for low cost and are generally used; but they leave much to be desired in mechanical electrical and chemical resistance. A new expedient for improving asphaltic battery containers in these respects is to mold the asphaltic shapes and line them with a synthetic resin, e. g. Bakelite, which when hardened is chemically inert. This lining also has excellent electrical resistance and mechanical strength. Thus an improved container is obtained, yet it is relatively inexpensive. (Societe des Accumulateurs Electriques, French Patent 771,652.)

● Phenol-formaldehyde resins are put to good use in a new rheostat for radio volume control. The resistance unit is made of carbon particles with a binder of Bakelite, mounted on a Bakelite base with the aid of a Bakelite varnish serving as an adhesive cement. (International Resistance Co., Ltd., French Patent 771,243.)

● Varicolored effects in molded articles are easily and economically obtained by the Raschig method, now employed in Europe. A colored lacquer, compounded especially for the purpose, is applied to the inside of the mold, in selected areas, before the molding operation: the finished article is then colored accordingly. (Kurt Brandenburger, Gelatine, Leim, Klebstoffe, May-June 1935, p. 92-94.)

● Molded housings formed an important part of the Belgian Radio Show in Brussels, Sept. 7-13, though the number displayed was less than the number of wood housings and cabinets. The designs represent much more radical departures from the conventional prevailing modes than any displayed at the German Radio Show, particularly in adaptation of the form to the nature of the material. Two small radio cabinets were outstanding in originality, one round with half its face in matt finish to avoid monotony, the other with loud speaker and dial face placed side by side. (Dr. Fomm, Plastische Massen, October, p. 295-6.)

● Brake linings, in the usual materials, cannot be readily compounded so as to have the required resistance to heat. If the binder is made with an asphaltic base it is softened by heat; drying oils cannot be oxidized to a sufficient hardness; and phenol-formaldehyde resins are hardened to the point of embrittlement. Even the most skilful compounding does not fully overcome these deficiencies. But glyptal resins which have been made in presence of oleic acid give a binder having excellent heat resistance. When made up into brake linings with wire cloth (preferably brass) or asbestos, these modified glyptal resins are neither softened nor embrittled in service. (Allgemeine Elektricitäts-Gesellschaft, German Patent 615,735.)

● A new toothbrush handle is molded with a beveled groove across the handle near its tip, to accommodate one or more spring clips on which initials or other insignia can be printed. Thus it becomes convenient to identify toothbrushes and so to avoid confusion where several brushes are kept together. (Abraham Luball, U. S. Patent 2,016,644.)

● Grinding wheels and similar shaped abrasive articles can be made much stronger than hitherto by using the phenol-formaldehyde resin binder in the B (resitol) state. The difficulty of bringing the resitols into solution has been a barrier to successful working of mixtures with abrasive powders; but new solvents have now been found which are highly effective (cyclohexanols). With their aid resitols can be easily compounded with carborundum or like powders; and since wetting of the hard abrasive particles is much improved in the new solvents, and the final conversion of the resin to its insoluble, infusible state is greatly facilitated, the final product is much stronger than formerly. (Bakelite Gesellschaft m. b. H., German Patent 613,051.)

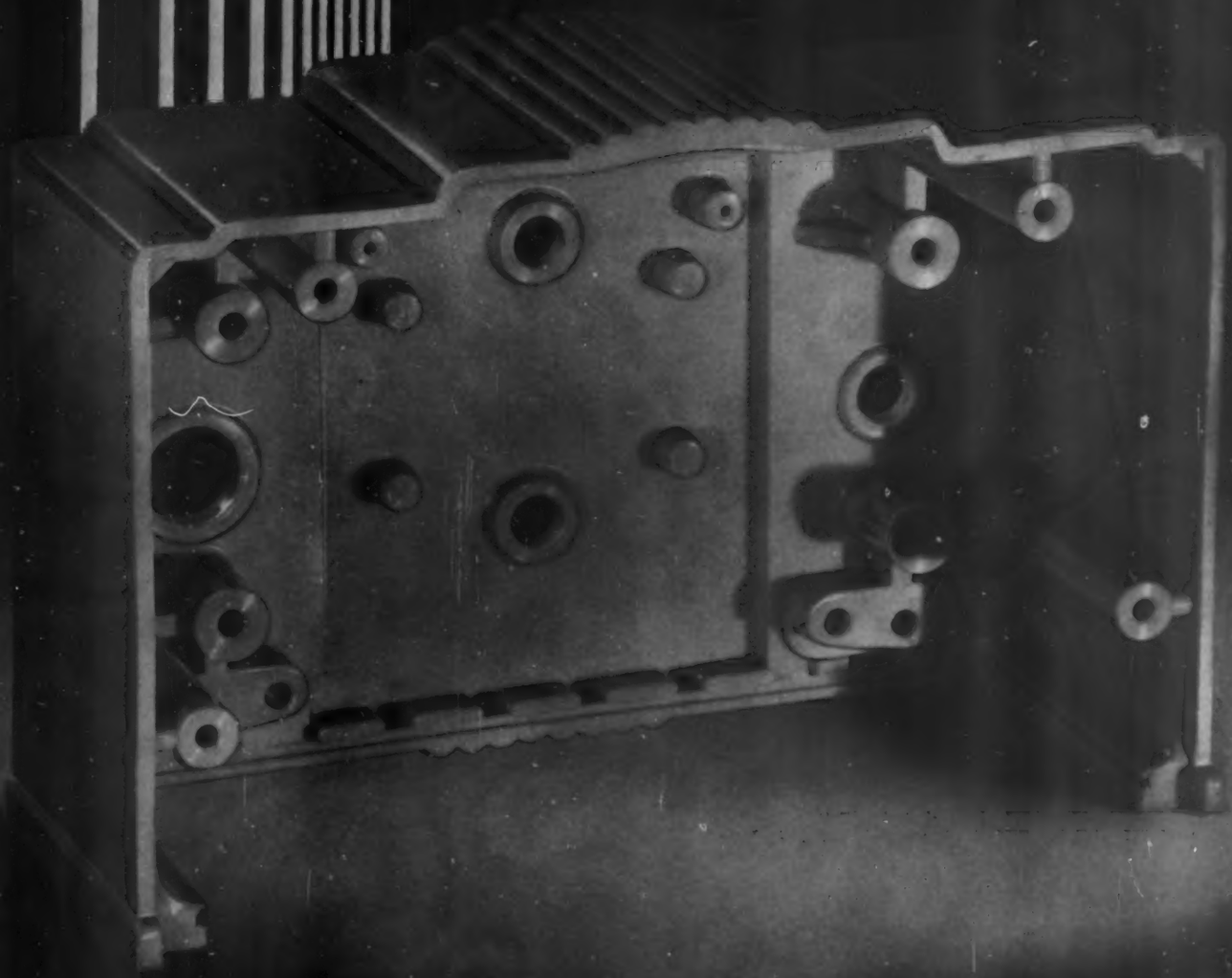
● In a new combined bottle cap and applicator a molded, threaded cap is shaped so that an applicator with rubber bulb and glass tip passes through a hole in the center of the threaded cap and is firmly held by an accurately molded annulus edge which defines the hole in the threaded cap. Thus cap and applicator are combined as effectively, for all practical purposes, as if molded in one piece. (Glenn A. Mengle, Brockway Sales Co., U. S. Patent 2,017,603.)

● Acid resisting linings for chemical apparatus are now made, as disclosed by the I. G. in Germany, from mixtures of hardenable synthetic resins with silicon or a silicide of carbon or of a heavy metal such as copper or iron. In addition to high resistance to chemical attack, the new linings have extraordinarily good adhesion to the materials (metals, wood, glass, stoneware, enameled ware, etc.) of which containers and reaction vessels are made for use in chemical plants. (I. G. Farbenindustrie A.-G., 615,928.)

● Homogeneity is an essential factor in successful molding of plastic compositions, but one which is not always easily attained. This is especially true of highly pigmented molding powders and those with relatively large amounts of fine, fibrous filler such as wood flour. Neither the solvent method nor the masticator method is fully satisfactory. As a novel expedient for making thoroughly homogeneous mixtures of synthetic resins, e. g. the resols, with pigments and fillers, the materials are first mixed by the usual mechanical means and then extruded through fine orifices in a heated nozzle under high pressure. The combination of high temperature and pressure is adjusted so that the time of exposure of the hardenable resin to these conditions is sufficient to soften or melt the resin and effect thoroughly intimate admixture with the pigments and fillers, but not long enough to convert the resin from the resol state to a later state of condensation. The product is thoroughly homogeneous, with even the finest pores of the filler permeated by the resin; and molded articles made from such products have all the advantages of homogeneity. (Dr. Richard Hessen, Aug. Nowack Aktiengesellschaft, German Patent 616,178.)

● A peculiarly elastic and flexible resin, for use as such in molding compositions or for addition to resins which lack elasticity, is made by condensing formaldehyde, not with urea, but with its close chemical relative, the diamide of hydrazinedicarboxylic acid. The dithioamide of the same acid can also be used. These two amides are derived from urea, or thiourea, by linkage of two molecules with loss of two atoms of hydrogen. The reason for the great elasticity obtained in these resins, as compared with the ordinary urea (or thiourea) resins, is not explained as yet. (I. G., Farbenindustrie A.-G., German Patent 616,429.)

# PRECISION



MOLDED BY THE BOONTON MOLDING CO.
BOONTON, N. J.
*UNYTE COLOR CREAM IVORY L-666*

UNYTE
REG U S PAT OFF.
MOLDING COMPOUNDS

**UNYTE CORPORATION**
521 FIFTH AVENUE, NEW YORK CITY

# Keeping posted

## More and better golf

The plastics industry gathered in three sections of the country recently to do something about—not its business, which is good—but about its golf, which is not so good.

The Western division, under the leadership of W. L. Kelly, Chicago Molded Products Corp., brought forty-seven members of the industry to the Inverness Golf Club at Toledo, Ohio, Sept. 24. At a speechless banquet in the evening Allan Fritzsche, chairman of the golf committee announced winners of the various prizes, most of which were won by the committee (humph) as follows: Low net, first prize, W. N. Shepard; second prize, R. B. Harrison. Least putts, first prize, W. L. Kelly; second prize, F. Morlock. High gross, M. Barchard; most fives, A. W. Fritzsche; most sixes, R. A. Austin; most sevens, H. D. Payne. Kickers handicap, first prize, C. E. Brocklebank; second prize, W. J. Dunnican; third prize, W. B. Hoey.

Chairman Kelly announced plans for a winter meeting to be held probably either in Detroit or Chicago.

Molders' mascot elected Sept. 25 at Buckwood Inn. The photo is a little foggy—but not the mascot.

We had hoped he would choose Florida or Bermuda.

The N. Y.-N. J. division was summoned to Buckwood Inn, Shawnee on Delaware by George Scribner, Boonton Molding Co., chairman of this sector, Sept. 25. Twenty-nine molders and material suppliers gathered for a similar day of golf and fun. A team match between molders and raw material manufacturers was won by the molders with a silver cup as the prize. Individual scores gave low gross to Gordon Brown, low net to Charles Ray, kickers handicap to Gordon Brown, high nines to S. M. Silverstein, most sixes to Ray St. Laurent, most fives to Alan Cole, most sevens to C. A. Breskin and low nine to George Scribner. Appropriate prizes were awarded to each.

G. Victor Sammet, Northern Industrial Chemical Co., and chairman of the New England division, chose the Berkshire Hunt and Country Club, Lenox, Mass., as the meeting ground for his group on October 8. Forty-nine industrialists gathered to improve their golf, or try to, and enjoy the special display Nature had prepared for their inspiration. There is probably no spot more beautiful than New England in October, especially the Berkshires of which the Club House has a commanding view. Trees for miles around presented a riot of color glorious to see. Golf was ad lib without prizes or rules and everyone seemed to like it that way. Dinner over, the golfers and noise were unequally distributed between the main building of the club and its several cottages where sooner or later everyone crawled in between all the blankets he could find and went to sleep.

## Chemical exposition

America's chemical preparedness will be revealed and reviewed at the 15th Exposition of Chemical Industries, which occurs this year during the week of December 2-7, at Grand Central Palace, New York City. The establishment of a self-contained synthetic organic chemical industry in the United States is the only thing of substantial value which America got out of the World War. Its establishment, according to *Chemical Industries,* meant more to the American people than reparations or territory. It emancipated our research, our medicine, our agriculture, and industries employing millions of men and women and manufacturing billions of dollars of products each year. On the firing line constantly during depression, the chemical industries fared better than most. Now, in their first Exposition following the depression, they are expected to reveal a pageant of research progress and to set before the industrial world an example in terms of materials and machines.


## FROM THE PRESS

The advance of the plastics industry has been so outstanding that it has definite "news" value as reflected in the general press. Newspapers and magazines the country over frequently consult with MODERN PLASTICS and quote quite generously from its pages. Illustration herewith gives a glimpse of the trend.

## THE LEADER

Widening the front of general publicity for the industry is only one of the many achievements of MODERN PLASTICS. In every way this publication seeks to further the best interests of the entire industry. Every person interested in plastics should be a regular subscriber; every firm with a sales message should be a regular advertiser.


# MODERN PLASTICS

BRESKIN & CHARLTON PUBLISHING CORP.

425 FOURTH AVENUE, NEW YORK CITY

# Keeping posted

Booth of the American Catalin Corp. to be displayed at the Chemical Exhibition, Grand Central Palace

It will be remembered that during these recent years plastics have obtained their greatest growth and the exhibits of those engaged in this industry will be interesting to see. Among those exhibiting are the American Catalin Corp., Bakelite Corp., Carbide & Carbon Chemicals Corp., Continental Diamond Fibre Co., Durite Plastics, Glyco Products Co., Inc., Haveg Corp., Stokes & Smith Co. and Toledo Synthetic Products, Inc. General Electric Co., which has a large plastics division, will also be an exhibitor.

## Government buys laminated

Progress of laminated plastics as a finishing material in the building field was illustrated early in October by the placing of the largest order for this material ever placed for any one building. The order amounted to $95,000.00 and was placed by the Consolidated Engineering Company of Baltimore, general contractors for material to be used in the new annex to the Library of Congress to be erected in Washington.

Pierson & Wilson of Washington were the architects. They specified the Formica for wall covering in the corridors, shelving and facing of book shelves in the reading and reference rooms, telephone booths, baseboard, chair rails, fronts of card index drawers, and for many counter tops throughout the building.

The material has also been widely used by the treasury department for counter tops in post offices and court houses; for doors in many important buildings such as the Pennsylvania Station in Newark; and there are several important installations under way in ships now under construction.

## Back from Europe

John A. Silver, Vice-president of the F. J. Stokes Machine Company of Philadelphia, Pa., makers of chemical, pharmaceutical and special process equipment, has just returned with Mrs. Silver from an eight weeks' stay in England. Mr. Silver spent considerable time visiting plants in the various fields served by his company and in conference with their British agents.

## Dure-z-Wood

General Plastics Inc. has issued a folder announcing Dure-z-Wood which is basically plywood, but a new kind of plywood which can never delaminate or separate even when boiled in water or baked in an oven. It is claimed to be absolutely water-proof, weather-proof, vermin-proof and heat-proof. Since it is pre-surfaced in a variety of finishes, it should be good news to those interested in better materials for exterior and interior finishes—and best of all—it is not expensive.

## International technical pact

An international agreement in the plastic field was revealed recently, with the announcement of the signing of a ten-year contract between Toledo Synthetic Products, Inc., manufacturers of the plastic material Plaskon, and Imperial Chemical Industries, Ltd., of Great Britain, one of the largest chemical organizations in the world. The agreement which was made to run for ten years from June 30, 1935, extends to molding compounds and laminated compounds made from urea formaldehyde resins or urea-thiourea formaldehyde resins.

Under the agreement, the concerns involved have contracted to exchange all technical, commercial and other information relating to the agreement products and processes, and have agreed also to grant each other free licenses under the patents which are already or may be secured under the life of the contract.

The same agreement extends to Montecatini, the Italian chemical trust. A separate agreement has been signed with Canadian Industries, Ltd., appointing that concern sole agent for Plaskon in Newfoundland and Canada.

James L. Rodgers, Jr., president of the Toledo Synthetic Products, Inc., commenting on the agreement, expressed the opinion, that "it will prove vastly beneficial scientifically as well as commercially to the two concerns and to their associates in the deal."

## Permanent exhibit

The first section of the Metal Products Exhibit—the first permanent exhibition of metals and plastics in this country—opened its doors to visitors recently, in the International Building, Rockefeller Center, New York. This exhibition, which is under the direction of Metal Products Exhibits, is designed to provide a comprehensive review of metallic and plastic materials and parts as used by industry. The entire third floor of the International Building has been reserved for exhibition purposes, but only a part of this space is at present ready for occupancy.

The plastics display comprises molded phenolics, ureas, and combination products, cold molded parts, cast resins, and laminated materials. Manufacturers represented include: American Catalin Co., Die Molding Corp., Formica Insulation Co., General Electric Co., General Industries, Kopack and Pyrons, Kurz-Kasch

Plastic display at Metal Products Exhibit

Co., Mack Molding Co., Makalot Corp., Marblette Corp., Molded Closure Service Corp., Northern Industrial Chemical Co., Norton Laboratories, Inc., Reynolds Spring Co., Richardson Co., Tech-Art Plastics Co., Fiberloid Corp., and Waterbury Button Co.

## Laminated roll-neck bearings

The September 16th issue of Steel—a publication devoted to production, processing, distribution and use—devotes three pages to an interesting story about the performance of phenolic laminated materials in roll-neck bearings. It proclaims them as non-galling and capable of withstanding heavy pounding.

The story goes on to say: "The last four years have seen the growth of lively interest in non-metallic roll-neck bearings made of laminated phenolic materials. They have been used extensively in steel and non-ferrous rolling mills throughout the country and have resulted in substantial savings in maintenance and production costs."

The story is written by H. M. Richardson, application engineer, Plastics Department, General Electric Co., and describes the process of manufacture of composition bearings, especially those of Textolite made by the General Electric Co. "Basic materials," he writes, "are cotton fabric, synthetic resin varnish of the phenol-formaldehyde type, and finely divided electric furnace graphite with ash content below 0.2 per cent."

In pointing out the effect of elasticity, Mr. Richardson writes: "Several properties of Textolite are responsible for its success as roll-neck bearing material. The first is elasticity, its most important quality. The elastic modulus in compression, calculated from careful tests of all grades of this material used in bearings, is 500,000 pounds per square inch, which means that for each 1000 pounds per square inch of bearing pressure there is a compressive deflection, or "spring" of 0.002-inch per inch of bearing thickness. It is this elasticity, or compressive springiness, which is primarily responsible for the ability of the material to carry bearing pressures up to 4000 pounds per square inch—in some cases much higher—with only water lubrication. This same elasticity, coupled with compressive strength ranging from 25,000 to 40,000 pounds per square inch, allows bearings made of this material to withstand an enormous amount of pounding without distress."

It would appear that there are many applications where the lightness and toughness of laminated phenolic bearings can be used in industrial plants other than steel mills.

## Exhibits at Waterbury

Waterbury, Conn., in its observance of the Connecticut Tercentenary built a unique Settlers' Village in Chase Park just outside the city. The Village was enclosed by a sturdy stockade closely identical with those built by early settlers in many New England villages. Visitors from many states wandered through the reproduced Colonial Homes, Hunters' Dugout, Irish House, Italian House, Polish House, French House, Lithuanian House, and Russian House, finally

Exhibit of plastics in Town Hall at Connecticut Tercentenary

congregating in the Town Hall located atop a hill at the far end. The Town Hall, designed in the spirit of early days and built of logs was constructed to house an industrial exhibition of products manufactured in Waterbury and surrounding towns. Plastics were well represented in the displays of Waterbury Button Co., Watertown Mfg. Co. and T. F. Butterfield.

## Blister-proof Micarta

A new heat resistant material suitable for application on bar, counter and table tops or any other surface likely to come in contact with lighted cigarettes and cigars has been developed by the Westinghouse Electric & Manufacturing Company. Known as Blister-Proof Micarta, it is made by molding a thin metal sheet directly beneath the surface of the Micarta plate. This sheets acts as a rapid conductor of heat, preventing high temperatures in local spots which otherwise might cause blistering of the material.

## James S. Ogsbury elected vice-president

The election of James S. Ogsbury to vice-president and comptroller of Whitman & Barnes, Inc., was announced by that company today. Mr. Ogsbury's headquarters will be in Detroit. Erik Andersen, treasurer of the company and its subsidiaries, has been elected vice-president and treasurer, with permanent headquarters in Chicago.

Past experience of Mr. Ogsbury includes various executive positions with International Business Machines Corporation, where he served in succession as

secretary; treasurer of that company, president of the Dayton Scale Company, a subsidiary; vice-president and general manager of the International Business Machines Co., Ltd., of Canada; and more recently general manager of the Dayton Scale Division, purchased in 1934 from International Business Machines Corporation by the Hobart Manufacturing Company.

## New switches by General Electric

A new line of water-tight push-button master switches, mounted in molded phenolic-compound enclosures and intended for naval-type installations or equivalent industrial applications, has been announced by the General Electric Company. Each unit is operated by a molded-compound lever, thus protecting the operator from electrical contact with any metallic parts that might be "alive," and as many as four units may be mounted in one enclosure. The units, designated as CR2940 master switches, provide both normally open and closed circuits. Either momentary-contact units or a combination of momentary-contact and latched-in units are available.

## Fabrication accessories

Martin M. Stekert announces the creation of hinges, clips, buckle accessories, beautifully pierced filigree, joints, catches and bracelet snaps especially suited to cast resin fabrication. Special metal work will be developed on order as desired.

## New building material

Farley & Loetscher Manufacturing Company have announced a new synthetic building material called Farlite, which is pre-finished with decorative designs. It combines beauty with remarkable durability and is made from a synthetic material, hot pressed into large sheets of various thicknesses with color designs and wood patterns molded into the surface. It is claimed that Farlite will retain its luster under severe service and that it will withstand heat up to 250°F. It is also stated that boiling water, hot dishes, and even smoldering cigarettes will not injure the finish of this new material.

## Wright gets injunction

Russel Wright has secured an injunction against Everlast Metal Products Corporation enjoining them, from simulating, copying, imitating, or selling the relish rosettes and cheese and cracker trays now manufactured by Wright in spun aluminum. Order was signed by New York Supreme Court Justice Charles B. McLaughlin, September 13, 1935.

## Beg pardon Arvin

It must be these old eyes of ours are getting feeble or maybe we need a stronger light in our molded desk lamp. Anyway, the Arvin radiator control head illustrated and described on page 21, September MODERN PLASTICS, should not have been spelled Arvis. We know better, and believe most of our readers are well enough acquainted with Arvin products to recognize it as an error in spelling which our proof-reader muffed.

## London office opened by Loewy

While in Europe this summer, Raymond Loewy became aware of the interest there in industrial design, especially in England, and opened an office in London. C. Lewis Otto from Mr. Loewy's New York office is in charge of the work abroad and it is reported that a full year's work has been booked.

## Art service projects

According to an announcement by Mrs. Frances M. Pollak, Director of the Art Service Projects of the Works Progress Administration, Gilbert Rohde will direct a school of design to be known as the Design Laboratory, patterned somewhat after the famous Bauhaus of Germany and free to adults. It will be located in a central midtown building, the exact address to be announced later: in the meanwhile information may be obtained at the offices of the Art Service Project, 137 E. 57th Street.

The Design Laboratory, the only one of its kind in America, will offer instruction in industrial design, graphic arts and fine arts. Its aim is not merely to train furniture designers, refrigerator designers or emphasize any specialty or skill of the student, but to teach the general principles of design. Consequently, courses will not be sharply defined but will overlap in several fields. There are no entrance requirements and the professional artist will be just as welcome as the amateur. Students will be placed in classes which best suit their needs, and instruction will be individual rather than mass.

"Since we are interested in teaching the general principles of design," states Mr. Rohde, "there will be one session every two weeks devoted to a meeting of all industrial classes and possibly the graphic arts classes at which each instructor will preside in turn.

Special emphasis will be placed on instruction in industrial design because Mr. Rohde believes that this field has been hitherto neglected in America.

"Although," he says, "we have excellent schools of fine arts, a few in graphic arts and many good trade schools, we need a school which coordinates training in esthetics, industrial products, machine fabrication and merchandising. Training which emphasizes coordination is essential in the preparation of the industrial designer for his work."

Also, beginners enrolled in the school will be required to take some actual shop practice in both wood, metal, pottery and in textile, as well as the customary practice in drawing board design. Later on, weaving and textile classes will be added. Instruction in the fabrication of plastics with demonstrations from moldings and dies will be given as part of the course.

"Furthermore," states Mr. Rohde, "instruction in wood, metal and plastics will be unified as it will be necessary for the designer to know how to use each material alone or in combinations with other materials. The school will not turn out skilled craftsmen, that is the function of the trade school. The instructor will simply give the student an understanding of what are the limitations of the machine as well as hand tools."

In addition to instruction in the principles of design and a certain amount of elementary instruction

in machine fabrication, the student will have an opportunity to specialize in the branch of industrial design in which he is most interested.

### Who knows the answer?

Readers' inquiries to which we, too, would like to know the answers. Who makes—"Diatomite"? "Shalorite"? "Hurlinite"? "Glassoid"? "Safetyloid"? What is the address of Molded Displays, Inc.?

## Books of the month

**Booklets reviewed in these columns will be sent without charge to executives who write for them on their company letterheads. Other books will be sent postpaid at the publishers' advertised prices.**

### Chemical Engineering Catalog

**Reinhold Publishing Corp. ($3.00)**

The Process Industries' Catalog contains eight hundred and sixty-three pages of collected, condensed and standardized data on equipment, machinery, laboratory supplies, heavy and fine chemicals and raw materials used in the industries employing chemical processes and manufacture. Classified indexes of such equipment and materials are carefully cross-referenced with the first ninety-four pages devoted exclusively to firms whose products are cataloged, a trade name index, and a classified index of equipment and supplies. There is a technical and scientific books section, cataloging and briefly describing a practically complete list of books in English on chemical and related subjects.

The present edition of the Chemical Engineering Catalog marks the completion of twenty years of service to the process industries and contains more than one hundred pages over the previous edition.

"A new step has been taken this year," according to a statement from the Committee, "in permitting the inclusion of complete catalogs prepared individually by the firms concerned. This permits greater flexibility as to the arrangement of the material, but the basic principle of restricting the copy to actual technical data has been adhered to. We believe that the present edition will impress its users as containing a greater wealth of actual information than in previous volumes." This is truly the buyers guide of the process industries which none can afford to do without.

### Modern Publicity

**Edited by F. A. Mercer and William Gaunt**
**The Studio Publications Inc., London ($4.50)**

This Commercial Art Annual, which made its appearance in October, has one hundred and twenty-seven pages of high test fuel for sluggish advertising imaginations. It is literally loaded with inspiring examples of the most choice advertising design in Europe and America. Besides a symposium of short brilliant articles written by authors, artists, advertisers and agents, there are one hundred and fifty-nine illustrations, many of them in two and four colors.

"Modern Publicity," says Mr. Mercer in his introductory paragraph, "has long established itself with the advertising profession; its service to advertisers is known round the world. It now proposes to extend its usefulness. In this issue, we propose to address ourselves to the man who does his own advertising, to consider some of the essentials of success, and some of the pitfalls in the way."

That this has been done admirably, there is no doubt. With this book as his guide, the man who does his own advertising, or intrusts it in hands with meagre experience, will find abundant examples of poster, magazine, newspaper and direct mail layouts and illustration as well as a well planned section of package design in which plastics are not entirely without honor. Descriptive copy which accompanies the illustrations is never presumptive. Criticism and approbation are directed with equal force and clarity to assure the reader of the proper paths to follow and to indicate those which prudent advertisers would avoid. All in all, a splendid advertising guide.

## Industrial Design and the Future

**By Geoffrey Holme**
**The Studio Publications Inc. ($7.50)**

Although published last year, this book deals with a subject so vital to industry—especially the plastics industry—that we believe it merits a review even at this late date. "The appearance of things" becomes increasingly important to those responsible for their creation and if plastics are to rise from a field of miserable price competition to occupy the place of importance and profit awaiting them in decorative fields, the working fundamentals of industrial design must be recognized and understood.

"Industrial Design and the Future" devotes one hundred and eighty pages to an analysis of the essentials and needs of industry; present means of supplying them and how these means could be improved. Training, education, organization, the capacity of the machine, and the place of the designer in industry have been covered in a thorough and interesting manner. Their importance is convincingly justified.

The information is based upon the personal experience of the author, who for fifteen years has edited *The London Studio* an art magazine which not only deals with painting, drawing, sculptoring and engraving, but shows how beauty and utility go hand in hand. Augmenting his personal experience, Mr. Holme has broadened his research with a world wide enquiry to industrialists, architects and designers, on which much of the pertinent material is based. It is presented in question and answer form reported verbatim so that readers may compare the general views of the author with the ideas and problems of those actually concerned with industrial design.

More than eighty pages are made up of half-tone illustrations depicting designs both old and new—comparing good forms with bad—in a range of subjects from kitchenware (designed for the millions) and continuing through architecture to various vehicles of modern transportation, with a few illustrations of revolutionary character indicative of the future.

## A.S.T.M. standards on electrical insulating materials

**Bound in paper $1.75**

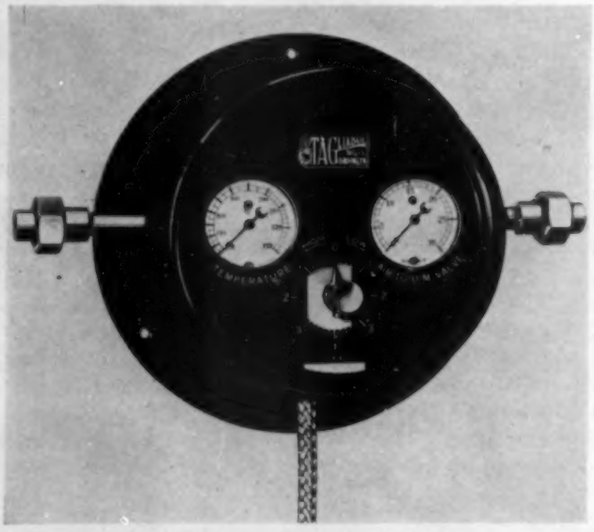
This compilation presents under a single cover A.S.T.M. standards that are in widespread use for testing and evaluating electrical insulating materials. The 1935 edition, 311 pages, gives 25 standardized methods of test and ten specifications. The method of testing shellac has not been published heretofore. During 1935, revisions were made in a number of the test methods including those covering the following:—varnishes, solid filling and treating compounds, molding powders, sheet and plate materials, laminated tubes and round rods, natural mica and flexible varnished tubing. Other tests which are included cover procedures for thickness testing, impact, thermal conductivity, resistivity. Special prices are in effect on orders for ten or more copies.

## Ford exhibits designed by Teague

Walter Dorwin Teague has prepared an interesting reprint from Forum, describing and picturing the Ford Building and exhibits which he designed at the California Pacific International Exposition. Forum format is retained even to the spiral binding.

## New TAG controller

A new instrument to be known as the TAG Number 40 Controller, ideally suited to the majority of automatic temperature control applications, has been recently put on the market by the C. J. Tagliabue Manufacturing Company.




The principle of control is basically the TAG movement which has served industry so successfully for many years. It has been redesigned for compactness in such a fashion that the few simple parts are accessible with exceptional ease. The smallest change in temperature is transmitted positively and with great precision to the TAG Ball Air Valve which in turn resets the rate-of-flow through the diaphragm actuated control valve. An interesting bulletin giving complete details of operation, specifications and prices will be sent on request.

## Anybody need $50,000?

"Loans up to $50,000" is the title of a 24 page booklet recently published by the Federal Housing Administration. It is designed to inform merchants, manufacturers, and all owners of business property regarding certain provisions of the National Housing Act, and the advantages of using government insured modernization credit to improve business property. It is interestingly written in question-and-answer style with regulations clearly explained. Many illustrations of remodeled buildings show what appear to be laminated applications but all mention of particular materials of any sort is studiously avoided and for good reason.

## Molded plastics

This is the title of an unusually well arranged and illustrated 24 page book published by Reynolds Spring Co. It deals with the many uses as well as the limitations of molded materials and points out the reasons for the use of different kinds of molding powders. Specific properties of a number of plastics are given, and a section is devoted to injection molding for high speed large production and multiple molding of thin-walled articles. This is one of the most informative booklets that we have seen.

## Cloisonné now available

Gemloid Corporation announces a new product, Enameloid-Cloisonné, which is said to be well adapted to the decoration of containers and bottle and jar tops. This processed material is available in sheet form, individual designs chosen by the customer being embossed in unlimited cloisonné effects.

Manufacturers have been quick to realize the possibilities of this decorative plastic development, the company adds, and numerous types of products are being decorated with it today. It is stated that any design, figure or pattern in cloisonné effects may be easily obtained and that the material in many instances lowers manufacturing costs, beautifies the product and opens new avenues of sales while widening the packaging range in the novelty and specialty fields.

Made under a patented process, Enameloid-Cloisonné is unusual for its decorative effects with a definite appeal to the feminine consumer element. The Gemloid Corporation has issued a catalog, available on request, which describes and contains samples of this material.

## Silver Anniversary

The Silver Anniversary number of Bakelite Review presents an imposing history of the Bakelite Corporation from the birth of oxybenzylmethylenglycolanhydride (pronounced resinoid) in a humble laboratory at Yonkers, N. Y. to its thousands of materials for millions of uses manufactured today in its 125 acre plant at Bound Brook, N. J.

It begins with the researches of phenol-aldehyde conducted by Dr. L. H. Baekeland between 1905 and 1909 and reveals the adventurous outgrowth and development of this research up to the present time.

Amusing incidents which add interest to the story are related in a human vein that prevent monotony and the chapter titled "I remember when," written by The Old Timer, drags skeletons from many a closet and writes some interesting yarns.

An enlightening chapter is devoted to well-known uses and applications of phenolics in their various forms and fields, and the final chapter sets forth the new developments of today with an indication of what may be expected tomorrow and the day after.

We especially like the concluding paragraph and with a sincere hope that it will be widely read by executives in all industry we reprint it here. "To none of these stories can the word 'Finis' be written. The race to supply the world with new things finds all industry in a constant state of change. In the Bakelite Research Laboratories chemists and physicists are at work on these new problems. Today, to these men, is history. They live in terms of Tomorrow. They work on products that exist only in the minds of industry's progressive thinkers, and are cooperating with these men in their effort to anticipate the public desire."

---

## Cast Resins in the Making

(*Continued from page 19*) of dehydration. This point is one of the most critical in the whole process since it bears upon the subsequent rate of hardening of the resin, and its viscosity during the pouring period.

The clarity of the resin depends upon the amount of its water content. Finished resins always contain water in colloid form, but the greater the degree of dehydration, the clearer will be the result. In the final stage, a suitable acid is added to produce the desired degree of acidity, since polymerization would proceed too rapidly if the resin were left in an alkaline condition.

At this point, the chemist's skill comes to the fore, for now the resin is dyed or given mottled effects. Analine dyes, soluble in alcohol and phenol, are mixed into the kettle. Translucent or opaque colors are produced by a pigment, and mottled and other effects by mixing a pigment into a resin of a different viscosity than that to be treated, and, then stirring this mixture into the larger volume of clear or tinted resin. Indeed, it is like folding two different kinds of dough into one another to make a marble cake.

After the cooked resin has been tested for color and texture, it is poured from a valve at the bottom of the kettle into big sauce pans and other containers.

Nearby stands a rack on wheels holding the lead molds. Most of the molds are made of lead. They are prepared by dipping patterns or arbors into molten lead and then stripping the shell that freezes around the form. One factory boasts as many as 4,000 patterns. The molds are fitted into holding frames, and the liquid resin is poured into them. Small sheets of resin are cast on edge between glass plates, or in metal molds. Large ones are cut from partly cured blocks and returned to the oven for final cure. A large percentage of the cast resin output, however, is produced in the form of rods, tubes, and special shapes for knife handles, lamp parts, and a variety of other patterns.

The process of pouring the resin into molds re-

sembles the way Grandma poured out hard candy into blobs or sticks on greased paper. The racks containing the molds are wheeled into the curing ovens, resembling large bricklined cells. Sliding doors close the row of ovens, the heating process begins, and the resin bakes for several days, at a uniform temperature.

After the resin has been baked, it is removed by a pneumatic hammer which destroys the lead molds. The waste lead is then dumped back into a melting furnace to be used again.

The resin is then tested, inspected and packed for shipment. Instead of it being yesterday's "Grandma, the taffy is *too* delicious!" it's today's "Thanks for your cast resin, Modern Science! !"

### Cast Molds May Widen Market

(*Continued from page 26*) occurring in another medium, such as leather, wood, etc. In instances of this sort, the cast process presents favorable conditions over anything that can be done in a good steel mold.

### Conditions Unfavorable to Cast Molds

*Where exact dimensional accuracy is of prime importance.* Since cast molds are made in a manner substantially the same as ordinary castings, and since beryllium copper, in common with most metals, has a shrinkage factor which is determinable only to a reasonable degree, it is not possible to produce pieces having exact dimensions where the limits are expressed in thousandths. Further, as one of the major factors of economy in the use of cast molds is brought about by finishing the as-cast surfaces by abrasives and buffing without machine tool applications, it is apparent that exact accuracy cannot be expected. It is possible, and in certain cases desirable, to machine finish a cast mold, but in general the cost of this work destroys much of the advantage.

*Where plain smooth surfaces of exact refinement are necessary.* As cited in the previous paragraph, a large element of the economy in cast molds is in the method of finishing and the small effort involved therein. However, since the finishing procedure involves the use of tools of a character not designed to produce absolutely plain areas, extensive surfaces are apt, unless actually machined, to exhibit wavy characteristics. It is true that minor minute casting defects will occur on the surface of a cast mold. Where surfaces are severely plain any such defects are especially evident, and, as the areas of the surface increase, there is more likelihood of encountering them.

*Where simple geometric forms are involved and molds can be cut with conventional machines or easily formed with inexpensive hobs.* It is apparent that where cost of machining is of minor consequence it is not worth while to go to the trouble of casting a thing to form, the surface of which still requires an appreciable amount of finishing.

*Where molds are small so that the material to be removed by machine or displaced by hobbing is not extreme.* It is evident that the removable or displacement material is a decided factor in machining cost. Where little material is involved, machining costs, all other things being equal, are likely to be small, and there is little purpose in going to the trouble of mak-

ing a casting in an expensive alloy in such instances.

*In positive or semi-positive, multiple cavity molds where cavities are small and easily hobbed.* In such molds, the procedure for mounting the cavities must be similar to that used in conventional steel molds. This demands the provision of retaining plates, possibly heating lines, and machining the cavities to fit the cavity recesses, all of which work is comparable with that involved in making a steel mold of the same type. The only saving then can be in the hobbing operation. Where cavities are small, hobbing is simple and easily done so that cast molds present no practical advantage.

## Cost of Cast Molds

Any attempt to give accurate cost comparisons of cast beryllium-copper and steel molds is essentially impractical, because of the infinite number of variables involved. In general, it can only be stated that in extreme cases, such as in large flat ornamental panels, the cost of a cast mold may be one-tenth, or less, of that of a steel mold for a similar piece. From there on, presuming the practicability of their application, the saving decreases as ornamentation becomes less. As plain surfaces and accuracy become more important, or on the technical type of mold, a cast mold, in many instances, might cost more than a steel mold and not be as satisfactory.

Despite the limiting factors mentioned in this article, cast beryllium-copper molds may offer a widening market to the plastic industry in the field of decorative design, and for the production of molds for sample runs on borderline cases. By deliberately omitting consideration of molds which involve conventional machining, little or no ornamentation, plain surfaces, molds produced by inexpensive hobbing, or where accuracy of design is a prime factor, the mold user will find a field of activity largely untouched. This field will include molds of prohibitive cost otherwise where enbellishment or irregular and difficult contours may compel the use of difficult machining for execution. This is especially true where a faithful and adequate rendition of an artistic design is essential, for it is here that a cast mold may produce a result far superior to any other method, and at a fraction of the cost. The molder, who will recognize these considerations, who will spot the instances where cast molds are usable in his regular production, will soon begin to look afield and solicit the potential business that has awaited the introduction of this new method for its development.

## Phenolics for '36 Clocks

(*Continued from page 27*) *disc numerals* can be replaced either by a circular ring of pastel colored cast plastic, or a circular disc could be used. Also, a plated metal ring with numerals stamped into its face and wiped in, could be easily attached in place of the separated numerals. Much variety in styles can be obtained, satisfying both the conservative and modern tastes.

As a still further example of the flexibility of the design, various color combinations can be used in the face and body. For instance, a chocolate brown body

with a bright orange face and copper trim might be a welcome change from too much chromium. Also, aluminum might be used for the metal parts, colored in gay pastels by the Alumilite process. Other variations of the same basic design will come to mind as one toys with the idea.

Phenolic plastics, in Mr. Federico's opinion, are probably the most logical material for clock cases yet developed. Its advantages over metal are that it does not glare unpleasantly, is lighter in weight, is non-resonant, is rich and pleasant to the touch, cannot dent, chip, or rust, and finally, it can be fabricated in an interesting variety of shapes, in combination with other materials, and has sculptural possibilities unobtainable in any other mass production material. The molded part of the clock illustrated is of Durez.

## Renaissance in plastics

(*Continued from page* 22) pleasing pattern on the cigarettes and the number of cigarettes the case contains can easily be seen without opening it. Another piece equally charming and in complete harmony, is a smaller compact with delicately chased bordering gold finish in the same manner as the cigarette case. The compact, however, is mirrored and has a thin fabric covering through which loose powder is drawn by the puff. The remaining pieces—one square and the other oval—were probably designed originally for snuff but are utterly practical and enchanting for carrying saccharin, aspirin or other intimate accessories and might even be used for rouge.

The cast resin material of which this set is made successfully plays a counterpart of the original tortoise shell. The pattern of these modern cases is identical to the set designed by Cellini and presents both its warmth and charm.

Plastic materials have thus been used in a new manner to recreate antique styles. These cast resin cases are irresistible for their old world glamour and the value of plastics in public esteem has increased with the inception of one more quality application. Credit to the Catalin Corp. for materials used, and to Whiting & Davis for manufacture.

## Progress in powder packaging

(*Continued from page* 21) The base, a disc of molded urea, is engraved simply on the under side with the Coty insignia and fragrance and color identification. It is of patented construction (patent applied for) and when pressed into place at the bottom of the cardboard drum, forms a perfectly leak-proof seal that cannot be twisted or turned.

This is the first time in powder packaging history that a box has been assembled after filling without any gluing or labeling operations. In any manufacturing business where sealing and labeling are more or less hand operations, reductions in such operations result in material savings and allow correspondingly greater merchandising values. Old methods of packaging frequently required as many as six or eight machine or hand operations to fill, seal and label a box of face or bath powder. Through constant serious study of manufacturing and packaging methods and a sincere desire to supply the women of America with

the finest possible cosmetic requisites, packaging Coty powder for some time has been reduced to two gluing operations. These consisted of sealing the bottom of the box with a cardboard plug and pasting a label over the entire bottom to conceal that plug. However, despite every precaution there was an inclination for the plug to show through the label. Then, too, the previous box had an opaque paper drum head and customers could not see the color of the contents without tearing the paper.

The new box is composed of three pieces: A cardboard drum with a flexible bead at the bottom and a printed cello-top, a molded urea base, and a cover. The printed cello-top of the drum acts as a window permitting customers to examine the shade of powder without damaging the drum head, and since the bottom is wide open, the drum is easy to fill. Sealing is reduced to a comparatively simple operation. The molded urea base is dropped into one side of the drum in contact with the bead and a gentle pressure of the operator's hand on the opposite side of the urea disc forces it by the bead where it snaps into place to make a permanent air-tight seal.


New shade selector display created specially for "Air Spun" Face Powder

In keeping with the modern influence, the cover of the box has a cello-jacket, shrunk on without adhesive or seams. It comes into the factory all ready to slip over the powder filled box and completes the packaging assembly. The cover fits tightly and will not slip off even when the box is picked up by the top.

It is obvious that a reduction of hand or machine operations from eight to three, through improved methods of packaging, in the production of say five to ten million boxes a year, would mean a substantial saving in packaging costs even though the cost of the box itself is greater. That Coty has passed this saving

along to the consumer is clearly evidenced by the fact that the new "Air-Spun" powder box has 40% more content by weight or volume than the old box but still retails at $1.00.

The cello-jacket protects the gold and white daintiness of the cover from finger prints and smudges. It can be dusted or cleaned with a damp cloth without danger of scratching or marring the surface. Consequently the boxes never become shopworn or unsaleable on the dealers' shelves. Furthermore, the cello-jacket obviates the need of individual wrapping en route to dealers. Previous packages of Coty powder were wrapped and sealed with printed tape which completely concealed the real beauty of the packages for display purposes. The new box with its molded urea base and cello-jacketed cover is packed twelve in a carton separated only by thin partitions. They can even be packed one on top of the other without fear of damage, and the boxes are ready for display as soon as the carton is opened.

"We do not want to cast aspersions on our former box," says a Coty executive, "for it was a best seller and served its purpose admirably. To quarrel with its design and function now would be as unreasonable as to censure the man who invented automobiles for not inventing the airplane. It is simply that the new box is built along modern lines in which we have incorporated new materials in contiguity with the development of 'air-spun' powder.

"We are very proud of our new box because it is functional in construction. There is no gingerbread or unnecessary ornamentation. The design is incidental and is not superimposed on the elements in an obtrusive way. Each element contributes to the fixed purpose of efficiency in every way, from the cellulose covering to the plastic base, not forgetting the importance of the cellulose 'window' which permits an unobstructed view of the shade of powder."

The molded urea base is of orange Plaskon in complete harmony with the color combination of the box and adds in no small measure to its quality appearance. Its moisture resisting surface prevents any possibility of dampness creeping inside the drum through the bottom. As an added feature, the Plaskon base has been discovered by users of the new face powder to make a good coaster when the powder is used.

## . . . speaking of handles

*(Continued from page 35)* best seller in the line. Since no other special advertising or selling efforts were used at the time, it is natural to conclude that the new material did the trick.

When asked about this, Mr. Schneider said: "The wide variety of color in cast resins and their high luster make the items more attractive on display and more desirable in the home. Not only that, but they are easier to fabricate than most materials and lower in cost."

The Cheeslicer soon followed the cake breaker with cast resin handles and exactly the same results occurred. Sales went up, costs went down. Fabrication became more simple and store displays produced more consumer interest. This is also true of other items the company makes such as corn holders and cocktail picks. The colorful handles added a decorative note

to the well established utilitarian appeal that merchandisers recognize as major factors in creating sales for accessory items such as these. Both items are now packed in a single box where their bright handles suggest their appropriateness as gifts. The handles are fabricated of Catalin for C. J. Schneider Mfg. Co. by The Kreul Co. and the Ivorycraft Co.

## Electrical heater plugs

*(Continued from page 34)* Several large makers of heater plugs cooperated with the Electrical Testing Laboratories in its extensive investigation of the faults of heater plugs and the reasons for failures. One of these makers states: "Many of the improvements . . . made in heater connectors are the result of tests established by the E.T.L. Before these tests, which set up a definite standard of comparison, little if any attention was paid to the durability of the connectors. As a result of the test specifications, however, important improvements have been made to provide considerably increased mechanical and electrical life . . . Improvements include . . . a material strengthening of the connector moldings to lessen the possibility of breakage due to dropping."

In producing heater plug moldings, two general types of material are employed; hot-molding phenolics and cold-molded materials. Some of the latter types though so classed are not really molded cold, since the molds may be heated to help produce more surface luster. In general, however, the cold-molded type is molded cold but the curing is not done in the mold as are materials in the hot-molded classification, but by subsequent baking in ovens. Cold-molding has the advantage of rapid production, usually with inexpensive single-cavity molds, though two or more cavities may be employed. The hot-molded plug, on the other hand, is usually made in rather expensive molds with a large number of cavities, because the curing takes time and lengthens the molding cycle.

Very important in the makeup of any molding compound for heating plugs is the type of filler used. The better grades usually contain asbestos fibre and some use this filler exclusively. There are various grades of asbestos filler. The long-fibre type is stronger and usually preferred. It is important that the filler should be heat-resistant because heater plugs usually operate at temperatures which are likely to weaken or char a cellulose material such as wood flour.

Opinions differ as to the relative advantages of cold-molded and hot-molded plugs. The former usually withstands higher temperatures without serious deterioration, but the latter has a higher luster which makes for improved appearance. In addition, they are sufficiently heat-resistant, providing good compounds are employed, for the temperatures to which they are usually subjected.

Tests conducted by the E.T.L. showed that greater shrinkage occurred, as a rule, with hot-molded plugs after prolonged heating under conditions encountered in service, and this may lead to loosening of screws and to other troubles. There was also more discoloration and more warpage with hot-molded plugs, but the cold-molded type is not entirely free from these faults. On the other hand, certain of the tests resulted in more breakage and showed less strength in the cold-molded.

Many compounds used in molding both types have been improved since these tests were made.

Although some makers of heater plugs still produce types with a metal armor, the E.T.L. tests indicated that th re is little if any advantage in so doing, especially as the use of such armor reduces the thickness of the molding that is possible with a given set of outside dimensions. For strength, it is desirable to have shells as thick as possible and still give proper clearance for other parts. As in all molding work, it is desirable to avoid sharp corners and to provide proper fillets in recesses and at ribs. Molded shells should have sufficient strength around the wire guard to avoid breakage where this is fastened and should include a ridge of material so placed as to prevent the guard from coming in contact with the inlead wires. Recesses for the latter should be sufficiently tortuous to prevent the wires from pulling out or from depending on the screw attachment to the clips for this purpose, and should, of course, keep the inlead wires well separated. Recesses for the clips should allow some clearance so that clips are self aligning when the plug is attached to an appliance, but should not permit of longitudinal motion of the clip as this is likely to stress or cause breakage of the inlead wires while the appliance is in use.

If screws are employed to hold the halves of the molded shell together, lugs surrounding them should be of ample size to prevent breakage when screws are tightened. Screws also ought to have lock washers which should preferably rest on plain washers to prevent the locking means from cracking the molding. When spring clips are used in place of fastening screws, as is done with success in some makes of plugs, they should have ample tension and should be made of a material which does not lose its tension in service. At least one prominent maker of electric appliances uses with much success plugs which are held together by a tubular rivet and a metal collar spun around the fastening for the wire guard. This not only make a secure and permanent fastening, but prevents the making of home repairs by someone not competent to effect them. As high grade materials and an excellent job of workmanship are used in making and assembling this plug, it gives long service without any attention whatever.

If a switch is employed, it should be well constructed and securely fastened, so that operating parts remain in proper relation even when fastening screws for the halves of the shell loosen. Light springs for snap switches are better than heavy ones because they do not overload bearings or produce excessive impacts on stops or contacts. Of course, springs should be of a material that retains its tension under service conditions and other parts should have adequate strength for the stresses imposed.

Those interested in making or buying heater plugs that will render satisfactory service will find many important details outlined in the reports of the Electrical Testing Laboratories, New York, and can avoid most faults by following the specifications which that organization has formulated. These specifications are the result of tests, both mechanical and electrical, which sufficiently simulate service conditions to make certain that plugs which pass the tests will give excellent service in every-day applications. So far as molded parts are concerned, one of the important tests in-

## CLASSIFIED



volves impacts resulting from repeated dropping of the plugs from a fixed height and is a good indication of the degree of fragility of the moldings, or of their impact strength. Since this test was devised the impact strength of molded shells has been improved considerably by both material producers and molders.

The writer acknowledges with thanks the assistance given him in compiling much of this information by the Electrical Testing Laboratories, the General Electric Company, and Cutler-Hammer, Inc. These organizations furnished the complete heater plugs and the separate moldings shown in accompanying illustrations.

## Methods of machining laminated material

(*Continued from page 17*) particularly important when drilling deep holes, due to the resinous nature of the material: the chips cause a great deal of friction and the heat generated causes them to become gummy quite readily, if not freed from the tool. No lubricant is necessary but it will be found helpful if a small can of water is kept close to the operator and lifted up under the drill every now and then in order to cool it. Drills may be fed rapidly but not forced and should be run at high speeds as for brass.

Particular attention should be paid to the direction in which the drilling is done with respect to the layers of material. In drilling parallel to the laminations, care must be taken to prevent splitting. This can best be prevented by clamping the material in a vise and using "flat" or "bottom" drills. In drilling perpendicular to the laminations, this precaution is not necessary, but care will have to be exercised so as not to split the material out on the back side, as the drill is pushed through. This can best be prevented by backing up the piece with some stiff material such as wood or stiff cardboard.

Ordinarily a drill cuts smaller than itself in laminated material, making the hole a few thousandths smaller than the drill. This may be overcome by grinding the drill slightly off center. For large diameter holes, ¾ in. diameter and over, a better method than using a drill would be to secure the material in a lathe chuck and remove the stock with an insertion tool.

### Milling

When milling laminated, a standard tool should be used at a speed and feed corresponding to that used in working bronze or soft steel. The cutting angle of the mill, if ground with a slight rake, will give better results.

### Threading

Threading may be done with both solid and self-opening dies. Small threads are more easily made by solid or adjustable dies, as the self-opening dies often tear off the thread in opening. Threads can also be cut in a lathe with tools ground without rake but with plenty of clearance. When cutting threads on a lathe, it is best to grind the tool on one side only.

The tools in all cases must be kept sharp, and the

use of turpentine, or a light oil, will assist greatly in obtaining clean threads. The threads may be cleaned by using a fine wire brush or a stiff hair brush. There may be slight variations in the methods used for the various grades of material being threaded, but any machinist with reasonable experience and a little imagination will be readily able to make adjustments for the easiest and most efficient method of handling.

## Tapping

When tapping holes, they should be drilled slightly larger than would be required if the material were metal. Either use a drill slightly larger or else a drill of correct size, but ground somewhat off center. It is well to experiment to find the size of hole that can be tapped out without binding on the tap and still give full threads. When tapping is done parallel to the laminations, it is always found advisable to clamp the material to equalize the stress on the material and thus prevent possible splitting.

## Punching

Laminated lends itself admirably to piercing, blanking and shaving operations. However, on the different grades, the results will vary somewhat, depending upon the thickness of the material and the physical and electrical properties desired. When making dies for punching this material, the punches should be made to fit the dies very closely. Approximately .002 in. clearance should be allowed between the punch and the die.

Since there is shrinkage in the holes after the punch leaves them, it is necessary that the punches be made larger than the required dimensions of the hole by an amount equal to approximately 2 per cent for material punched cold and approximately 4 per cent for material punched hot. The die consists of a punch which pierces the sheet, pushing out a blank; a die, which the punch slides into, and into which the blank is pushed; a stripper, which pushes the blank out of the die or off the punch; and a guide plate, which guides the punch. The punch and die must be kept sharp at all times to obtain the best results.

A safe practice to follow in punching is to leave a distance of three times the thickness of the material between adjacent punchings and between punchings and the edge of the strip. For the more flexible grades this distance can be decreased somewhat. Where a blank containing holes is punched with a good compound die, a distance between hole and edge of punching of ½ thickness of material should give satisfactory results.

Should the material show a tendency to break or crack when being punched, it should be heated to make it punch more easily. This is done by placing it in an oven heated to a temperature of approximately 125 degrees C. The material should be left in the oven long enough to be thoroughly heated through, but no longer, as continued heating makes the material more brittle and harder, and of course, more difficult to punch. All laminated materials referred to in this article are Micarta, manufactured by Westinghouse Electric and Manufacturing Company.

# INDEX OF MODERN PLASTICS ADVERTISERS